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XXXI.—ON SOME SPECIES OF IMPATIENS FROM THE MALAYAN PENINSULA: II.

(With Plate.)

J. D. Hooker.

In the 1909 volume of this *Bulletin* (pp. 1–12), I enumerated with diagnoses all the Indo-Chinese and Malayan Peninsula species of *Impatiens* then known to me. Nine of these were natives of the latter territory, in which five hitherto unpublished species have more recently been discovered.

Of these last two are so remarkable as to some of their characters that I venture to offer them for early publication, reserving the others in anticipation of fuller discoveries, especially by Mr. Ridley, who is on a visit to unexplored regions of the States. In both species the distal lobes of the wings are confluent, a prevalent character in the Indo-Malayan balsams.

Impatiens peltata, *Hk. f.*, sp. nov.; *I. Ridleyi*, Hk. f., affinis, caule humile basi repente, foliis carnosulis peltatim petiolatis labelloque cupulare calcare breve recto spiniforme instructo differt.

Herba glaberrima, 1·5–2 dm. alta, mediocriflora; caule erecto basi longe repente simplice v. parce ramoso ramis robustis inferne longe nudis. *Folia* 3–5 cm. lata, alterna, peltatim petiolata, carnosula, orbicularia, acuminata, integerrima v. minutissime serrulata, basi rotundata, nervis utrinque 4–6 gracillimis, petiolo gracile 2–3 cm. longo 2–4 mm. a margine inserto; glandulae infrapetiolares 0. *Inflorescentia* simpliciter pedicellata; pedicelli solitarii, erecti, petiolo breviores v. paullo longiores, basi ebracteati. *Flores* ad 2 cm. expansi, rosei, appendice (labello ?) flavido. *Sepala* 2, late oblique ovata, obtusa, 0·7–1·2 cm. longa, membranacea, costa nervisque obscuris. *Vexillum* flabelliforme, 1–1·5 cm. latum, muticum, costa gracile. *Alae* ad 2 cm. longae; lobi basales oblique pyriformes, longe stipitati, distales paullo breviores, in laminam orbicularem bifidam connatae; auriculae dorsales 0. *Labellum* amplum, saccatim infundibulare v. cupulare, inferne gibbose incurvum, supra gibbum calcare stricto spiniforme suberecto limbo labelli breviore instructum, ore horizontale obtuso. *Filamenta* linearia; antherae in capitulum decurvum connatae, obtusae. *Ovarium* gracile, fere rectum, acuminatum.

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Malay Peninsula. Mt. Murang: up a tributary of the Klong Pak Pla, in the N.W. corner of Lake Ta Lei Sap; about 7° 45′ N. and 100° 10′ E., in shady damp spots; "flower pink, process yellow"; *D. T. Gwynne Vaughan*, 264, in Herb. Kew. et Herb. Univ. Cantab.

The only species known to me having peltately attached petioles and a stiff, suberect, spiniform spur of the lip.

I. Vaughanii, *Hk. f.*, sp nov.; *I. macrosepalae*, Hk. f., affinis, foliis ovatis, sepalis obliquis apicibus lateralibus et calcare breve incurvo apice clavato bipartito differt.

Herba ramosa, glaberrima, 4–5 dm. alta, foliosa, floribus majusculis, caule gracile inferne nudo. *Folia* 8–12 cm. longa, alterna, longe petiolata, membranacea, ovata vel elliptica, acuminata, integerrima vel obscure crenata, basi rotundata vel late cuneata, utrinque 8–10- nervia, petiolo gracile 4–10 cm. longo; glandulae infrapetiolares 0. *Inflorescentia* simpliciter pedicellata; pedicelli solitarii, flores subaequantes, basi ebracteati. *Flores* ad 3 cm. diametro, alis vexilloque purpureis, labello flavido. *Sepala* 2, tenuissime membranacea, 1·2–1·5 cm. longa, oblique oblonga, uno latere cuspidata, limbum totum labelli tegentia. *Vexillum* parvum, 1–1·2 cm. longum, oblongum, costa dorso carinata. *Alarum* lobi basales rotundati, breviter stipitati, 1–1·2 cm. lati, distales in limbum amplum rotundatum apice bifidum connati; auriculae dorsales basi connatae. *Labelli* limbus cymbiformis, in calcar breve incurvum apice clavatum et bilobum attenuatum, ore horizontale 1·2–1·8 cm. longo acuminato. *Filamenta* filiformia; antherae in capitulum connatae, obtusae. *Ovarium* gracile, acuminatum.

Malay Peninsula. Jalor: Biserat, Patani river, on damp rocks; Lat. 6° 32′ N., Long. 101° 12′ E.; "lower two perianth segments greenish-yellow—tubular process cream-yellow—other segments deep violet to purple"; *D. T. Gwynne Vaughan*, 535, in Herb. Kew. et Herb. Univ. Cantab.

I. Vaughanii differs from all other species of *Impatiens* known to me in the large delicately membranous sepals that embrace the whole lip so closely as to be recognised and removed with difficulty. Each sepal is of an irregular oblong form with the nerves from the base arching to the lateral apex.

Explanation of Plate.

Impatiens peltata. Figs. 1, sepal; 2, standard petal; 3, wing petals; 4, spur petal; 5, two stamens; 6, pistil. All enlarged.

XXXII.—ON SOME POTENTILLAS FROM THE FAR EAST.

H. Takeda.

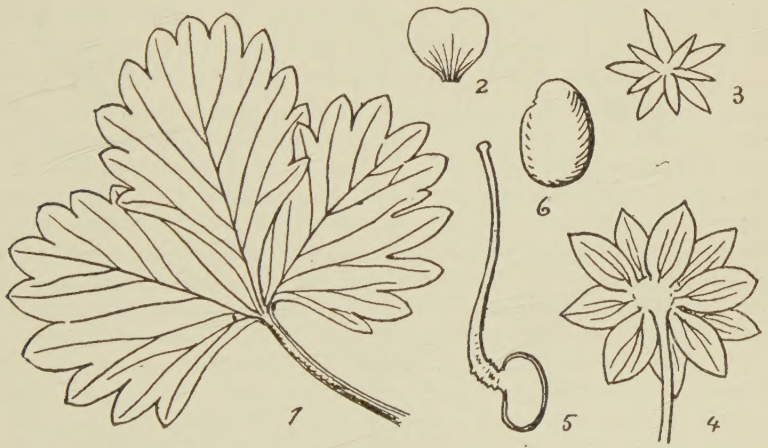
In this short paper I propose to clear up some misconceptions and confusion regarding a few Eastern Asiatic Potentillas. Since the publication of Th. Wolf's elaborate monograph the determination of Potentillas has been very much facilitated, and I hope few

mistakes will hereafter occur in any botanical publication. There seem still to remain some plants misreported from the Far East, which induces me to offer here some remarks from the phytogeographical as well as from the systematic point of view.

Under the name of *P. fragiformis* several different species have been reported. Also various views have been put forward with regard to the limit and relationship of *P. fragiformis*. Maximowicz and Hooker suggest that *P. grandiflora*, *P. gelida*, and *P. fragiformis* are the same species. As Th. Wolf states in his monograph (p. 510), *P. fragiformis* is often confused in herbaria with *P. grandiflora*, *P. gelida*, and *P. villosa*. Professor Miyabe in compiling the flora of the Kurile Islands at the Gray Herbarium studied these easily confused species and in his paper pointed out the different characters of the plants. He lays weight on the nature of the achene and regards those four plants as distinctive species, considering *P. grandiflora* and *P. gelida* as forming one group, while *P. fragiformis* and *P. villosa* form another. Th. Wolf discusses these plants and has thoroughly cleared up the previous misconception, so that there seems to be no need to add any further remark.

I wish to discuss here, however, the four other species known as *P. fragiformis*. The confusion is not unimportant from the phytogeographical point of view and will cause no little inconvenience if left untouched.

One of four plants reported as *P. fragiformis* is the true species. Descriptions of this can be found in Lehman's monograph as well as in Th. Wolf's recent work, and also a fairly good habit-figure in Lehman.



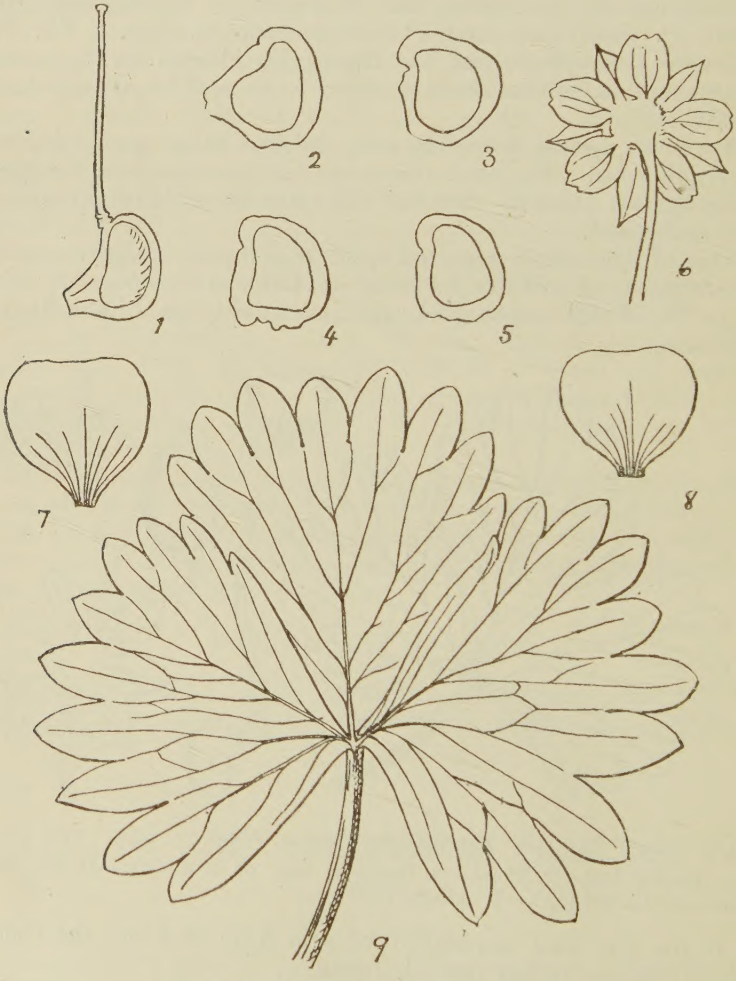
Potentilla fragiformis, Willd.

1. Radical leaf.—2. Petal.—3. Calyx at time of flowering.—4. The same in fruit.—5. Carpel ($\frac{12}{1}$).—6. Achene ($\frac{7}{1}$).

In the Far East this plant occurs in Amurland and the Ochotzk region, but not in any part of Japan.

The second one is a species closely allied to the preceding, but distinct and as it has been left unnamed, I propose to call it

P. megalantha because of its large flowers. The first specimen of *P. megalantha* was collected by Fr. Schmidt in the Island of Saghalien, who reported it as *P. fragiformis* in "Reisen im Amurlande und auf der Insel Sachalin." Afterwards the same species obtained at various places in Northern Japan was recorded by Prof. Miyabe in his Flora of the Kurile Islands under the same name. V. Komarov examined the specimens from Saghalien and from Kompumoi, Yezo, collected by Prof. Miyabe and preserved at the Kew Herbarium, and he considered them to be *P. fragiformis*. M. Palibine was kind enough to inform me that the Saghalien specimen was recently examined by Th. Wolf who also determined it as *P. fragiformis*. A study of these together with a good many specimens from Japan has brought me to the conclusion that the plant in question is distinct from the true *P. fragiformis* in the following points.



Potentilla megalantha, Takeda.

1. Carpel, immature ($\frac{5}{1}$).—2-5. Achenes ($\frac{5}{1}$).—6. Calyx after flowering.—7-8. Petals.—9. Radical leaf.

The achene of *P. megalantha* was described by Prof. Miyabe (Fl. Kuril., p. 231) as "more or less distinctly keeled." Close examination under a low power lens shows that it is not only keeled but really winged as may be seen in figs. 1–5, while that of *P. fragiformis* has only a slightly keeled ridge. Some botanists consider the marking of the achene is more important than the winged or keeled character. It may perhaps be so in the case of certain species, but not always. I have come across several instances of variation of the external nature of the achene in many species of *Potentilla*. In one and the same plant we can sometimes get both a smooth and a rugulose achene. The next marked distinction is to be found in the calyx. The calyx of *P. fragiformis* is only about 1·5 cm. across at the time of flowering, and after anthesis it increases its size enormously, becoming nearly twice as large as it was. This fact is also to be seen in Lehman's figure and also in descriptions by Maximowicz and Th. Wolf. A similar phenomenon also occurs in the allied species, *e.g.*, *P. Matsumurae*. The calyx of *P. megalantha* does, however, develop extremely slightly, so that the difference is hardly noticeable. Even in the flowering stage the size of the calyx of our plant is as large as that of *P. fragiformis* in fruit. The flower of *P. megalantha* is much larger than that of *P. fragiformis*, measuring about 4 cm. across. The petal is usually very shallowly notched. The hairy covering on the leaves of our plant is somewhat similar to that of the dwarf var. *lucida* of *P. fragiformis*, but the shape of the leaflets is rather peculiar. In the majority of cases I have noticed that the apex of the leaflet, or in other words, the central tooth which is traversed by the median vein, is markedly shorter than the adjacent teeth, so that the outline of the leaflet is obcordate and emarginate. The stipule of *P. fragiformis* is generally entire, while that of *P. megalantha* has a strong tendency to be lacerated or incised.

The third plant misreported as *P. fragiformis* is a rather distantly allied species:—*P. Freyniana*, Bornm. The plant was first recorded by A. Gray (Botany of Japan, p. 387), as *P. fragiformis* var. *japonica*. In 1873 Maximowicz described the plant as a variety of *P. fragarioides* and called it var. *ternata*, for it has ternate radical leaves. In 1902 Makino and Freyn independently raised this plant to the rank of a species and called it *P. ternata* adopting Maximowicz's varietal name. As there is already a plant bearing the name *P. ternata*, Bornmüller changed the name to *P. Freyniana*. The plant is distributed fairly widely in Eastern Asia and is quite common in Japan. This plant is again reported as *P. fragiformis* by Hemsley in Index Florae Sinensis. The specimens collected by Ross in Black Bear Valley, Shinking, in 1887, and also those collected by Mr. Henry in Ichang and Patung (nos. 349 and 1441), are quite obviously *P. Freyniana*. In the Kew Herbarium there exist other unpublished specimens of *P. Freyniana* from China collected by H. E. M. James in 1886 between Mukden and Tung-che-Hsien.

Until 1906 *P. Freyniana* was not known from China, when Matsuda reported it in the Tôkyô Botanical Magazine (vol. xx, p. 128), using one of its synonyms *P. fragarioides* var. *ternata*.

The specimen no. 1278, collected by Henry in Ichang and determined by Oliver as *P. fragiformis* and also referred to in Index Florae Sinensis by Hemsley, is neither *P. fragiformis* nor *P. Freyniana*, but in fact *P. fragarioides*. Henry's specimen collected in Yunnan (no. 10,905A), which is named *P. fragiformis* but not referred to in the Index, also represents *P. fragarioides*.

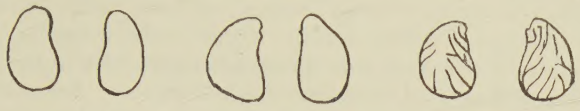
The separation of *P. Matsumurae* from *P. fragiformis* seems to be quite reasonable. The plant has long been known as *P. gelida* amongst Japanese botanists. Th. Wolf cites Franchet and Savatier's *P. fragiformis* var. *gelida* as one of the synonyms of *P. Matsumurae*. I rather fancy that the French authors meant *P. Freyniana* by this name. Before the publication of his monograph Th. Wolf himself called the plant by the name of *P. fragiformis*.

Th. Wolf published in his monograph a new variety of *P. Freyniana* called var. *grandiflora* (l.c. p. 640). The same plant was described by Makino in the Tôkyô Botanical Magazine (vol. xxiv, p. 142), with good reason as a new species :—*P. Yokusaiana*. According to the Japanese author this plant has subpinnate radical leaves besides the ternate one. He separates this plant from *P. Freyniana*, pointing out as characteristic the absence of the thick rhizome and the peculiar form and serration of the leaflet. This last character often serves for classifying plants empirically, and usually is very difficult to define.

The pinnate character of the radical leaf seems to me to be liable to variation in certain species. There is a specimen collected by Henry in Hupeh, which is not to be distinguished from *P. fragarioides*, although it possesses, like *P. Freyniana*, the ternate radical leaf; but by this feature alone we cannot recognise it as *P. Freyniana*.

P. Dickinsii, Franch. et Sav., was reduced by Makino to *P. ancistrifolia*, Bunge, of North China. Koidzumi calls it var. *Dickinsii* of *P. ancistrifolia*. In his monograph Th. Wolf tries to distinguish these plants as two distinct species, especially by the colour and marking of the achene, the hairs on the receptacle and by the number and texture of the leaflets. As I have been unable to examine any specimen of *P. ancistrifolia* from China, I will try, for the present, to judge their opinions by Wolf's and Komarov's descriptions, while I have examined a number of specimens of *P. Dickinsii*, including Dickins' collection. The texture of the leaf of *P. Dickinsii* may be called subcoriaceous and especially of the specimens growing in sunny dry places. Both surfaces and especially the nerves, which are prominent on the under surface, are covered with silky hairs as Franchet and Savatier point out. The cauline and even some of the radical leaves are often ternate, still I have seen in Dickins' specimens the inferior cauline ones are bi-jugous pinnate. The leaflet and especially the terminal one is generally petiolulate, but occasionally sessile ones are met with. In this species (and often in other species also), the number of leaflets is not constant. In *P. Dickinsii* the radical leaf varies from tri-jugous pinnate to simple with one rounded blade (forma

simplicifolia, Takeda, in Tôkyô Botanical Magazine, xxiv, p. 63). The colour of the achene is not always nigro-fuscous, but very often light-fuscous.



1 2 3

Potentilla ancistrifolia, Bunge var. *Dickinsii*, Kordz. Achenes.—1. Dickins. 2. Faurie, no. 13,395. 3. Faurie, no. 13,240 ; all ($\frac{12}{1}$).

The surface is usually smooth and shining, but I observed that the specimens collected by Faurie (no. 13,240), at Towada, which have all the characters of *P. Dickinsii*, the achene is obliquely elevate-striated as the figure shows, which character is described as characteristic of *P. ancistrifolia*. The hair on the carpophore is generally long, but its length is rather variable. For the reasons above stated I really think *P. Dickinsii* should be united to *P. ancistrifolia*, as its variety ; and it is equally obvious that this variety should not be considered entirely the same as the typical form.

Descriptions of the New Species and Form.

Potentilla megalantha, *Takeda* ; *P. fragiformi*, Willd., affinis, a qua foliorum forma texturaque, floribus majoribus, calyce post anthesin paululum excrescente, petalis leviter retusis nec profunde emarginatis, annulis staminiferis pilosulis nec glabris, staminibus numerosioribus, acheniis alatis nec leviter carinatis satis distinguenda est.

Caudex crassus, pluriceps, caules plures pauci-vel plurifloros emittens. *Caules* crassi, validi, subcaespitosi, diffuse adcendentes, saepius ultrapedales (in speciminibus in rupibus siccis crescentibus caules pauciores debilioresque), dense pilosi, eglandulosi, 2–3-foliati, superne parce ramosi. *Folia* radicalia crassa, carnosula, plerumque longissime petiolata, majuscula, ternata, ambitu cordato-rotundata, apice emarginata, diametro ad 8 cm., supra dense pubescentia, juvenilia subsericea, infra densissime sericeo-villosa, micantia, margine dense villoso-ciliata, caulina radicalibus similia sed minora, brevius petiolata, floralia reducta, subsimplicia et sessilia vel brevissime petiolata ; stipulae foliorum radicalium membranaceae, extus villosiusculae, intus glabrae, latae, longe adnatae, auriculis ovato-oblongis tridentatis acutis acuminatisve ; foliola sessilia, ambitu flabellatim late obovata, terminalia obcordata, interdum breviter petiolulata, lateralia basi obliqua, margine profunde dentata, dentibus oblongo-ellipticis obtusis, mediis quam lateralibus plerumque brevioribus. *Flores* magni, aurei, initio breviter, post anthesin longe pedunculati, diametro ad 4 cm. interdum paulo ultra. *Calyx* villosus, post anthesin vix excrescens, 2–2·5 cm. diametro. *Sepala* externa vel rotundato-quadrata vel rotundato-ovata vel ovata, obtusa, anticum tridentatum vel subintegrum, breviora quam interna ovata ovato-lanceolatave acutaque. *Petala* late-obcordata,

retusa vel subtruncata leviterque sinuata, quam sepala interna duplo longiora (ad 1·8 cm. longa lataque) ; annulus staminifer plus minus pilosus, disco villoso a receptaculo separato. *Receptaculum* hemisphaericum, in fructu subglobosum, polycarpum, dense pilosum. *Carpella* oblongo-ovoidea, levia. *Stylus* subterminalis, basi brevi tractu leviter incrassatus, inde usque ad stigma dilatatum tenerrimus, carpello juvenili ad 6-plo (maturo duplo) longior. *Achenium* subauriforme, alatum, leve.—*P. fragiformis*, Fr. Schm., Reis. Amurl. Sachal. p. 127 ; Miyabe, Fl. Kuril. p. 231 : Matsudaira, in Tôkyô Bot. Mag. ix, p. 468, non Willd.—*P. grandiflora*, Maxim. in Bull. Acad. Imp. Sc. St. Petersb. xix, p. 167, pro parte.

Northern Japan. Yezo : without locality, *Maries* ; Kompumoi, *K. Miyabe*, 1. vii. 1884 ; rocks on the sea coast near Nemuro, *Faurie*, 3745, 5070 ; Eramachi, Oshima, *Miyabe* and *Tokubuchi*, 21. vii. 1890 ; Tumoshiri, *H. Takeda*, vii. 1909 ; Samani, prov. Hidaka, *Nirei*, 25. vi. 1893. Kurile : isl. Eturup, near Rubetsu, *Miyabe*, viii. 1884, *Mayr*, viii. 1890 ; isl. Urup, Tomarigawa, *K. Jimbô*, 15. vi. 1891; Megane, *T. Kitahara*, viii. 1895 ; Otoima-moi-pet, *K. Uchida*, 16. vi. 1891 ; isl. Ketoi, *Kodama*, vi. 1893 ; isl. Shimoshiri, *Kodama*, vi. 1893 ; isl. Shimushu, *T. Ishikawa*, vi. 1894, *K. Yendô*, viii. 1903. Saghalien : without locality, *Fr. Schmidt* ; Cheppopo, *T. Miyake*, 8. vii. 1908.

Potentilla fragarioides, *L.* var. **stolonifera**, *Maxim.* forma **trifoliolata**, *Takeda* ; foliis radicalibus ternatis ; a *P. Freyniana*, petiolis pilis patentibus villosis, foliolis supra pilosis subtus praesertim ad nervos adpresse villosis ciliatis, stipulis caulinis paucidentatis, floribus majoribus, sepalis exterioribus interiora ante anthesin superantibus distinguitur.

China. Hupeh, *Henry*, 7895.

XXXIII.—BLUE COUCH : A NEW LAWN GRASS.

(*Digitaria didactyla*, Willd.)

O. Stapf.

In the Agricultural Gazette of New South Wales of September 2, 1910, Mr. Maiden called attention to a grass, known at Sydney as "Blue Couch," the name referring to the blue-green hue the foliage assumes in summer. It seemed to have appeared first about 30 years ago, but without being much noticed until recently when it was also found in the Sydney Botanic Garden, the Federal Government House Grounds and in a private garden near Sydney. In every case it made its appearance in lawns, and although at first considered as an objectionable component it has now found some favour with experts as the following abstracts from the article referred to above will show.

Mr. T. G. Weston, head gardener, Federal Government House, states :

"It is a first-class grass for lawns, providing it be kept close mown and well watered during dry weather.

"Little or no top dressing is needed for the grass on ordinary lawns. On tennis lawns, &c., a light surfacing of fine sandy loam will be needed to keep a really good surface.

"In competition with Couch grass* it always obtains the mastery. Especially is this noticeable on closely cropped lawns. The dense growth of the Blue Couch appears to smother the Couch.

"Weeds such as clover, Oxalis, Medicago, &c., are just as troublesome on lawns covered by Blue Couch as those laid on Couch. It succumbs to asphalt or drought quicker than Couch does, but recovers much more rapidly. Lawns that were to all appearance dead, and upon the surface of which one has been afraid to use a broom, have, after a soaking by rain or sprinklers, recovered in two or three days to such an extent that the lawn-mower has been needed. It forms a denser surface than the Couch, and its runners are only about the same thickness.

"It travels over the surface much more slowly than Couch, but in forming new lawns, if seed were used, this would be an advantage, as the dense surface, so much desired, would be more quickly obtained. Providing it be kept close mown, it is an easy grass for the lawn-mower. If, however, it is allowed to obtain a little headway, especially during its flowering period, it will give the machine a large amount of trouble to reduce to a smooth uniform surface, as its stems pass in numbers between the knives and cutting-plate, and remain unsevered, presenting a mangled appearance. If the lawn-mower is in first-rate condition this does not happen, but practice and experience demonstrate that lawn-mowers are seldom in this much-to-be-desired state. If allowed to grow at will, few grasses give the really good scythe men more difficulty to mow creditably than this.

"Conclusions:—After two and a half years' experience I should still give Couch grass the preference for fine lawn work. It stands wear and tear better. It withstands drought better. During dull and showery weather it dries more quickly. It gives less trouble to the mowing-machine. It is quickly and easily repaired. Its runners lie closer to the ground. Weeds are removed more easily from it."

Even more favourable is a report furnished by Mr. Ernest A. Bonney, of Longueville, near Sydney, a gentleman who has had very considerable experience in regard to bowling greens and croquet lawns. He says:

"After an experience of five or six years of this grass on my croquet lawn at Longueville, on the Lane Cove River, my opinion is that it is much more suitable for bowling greens and croquet lawns in the coastal districts of New South Wales, especially in loamy or sandy soil, than the Couch, which is so generally used around Sydney. . . . My own lawn was made about nine years ago in dark sandy soil, the surface of which contained a considerable quantity of decayed vegetable matter. . . . About a fourth part of the lawn was turfed, and the remainder planted with Couch. About three years afterwards I noticed the Blue Couch, but do not know where it came from, as I have not seen it about Longueville.

* This name stands here for *Cynodon Dactylon*. The objectionable Couch grass of England is *Triticum repens*.

It gradually spread, and now covers an area of 300 square feet, and is continuing beyond the boundary of the playing area, where it has an opportunity of running to seed. . . .

"The advantages of this grass over Couch are as follow:—1. It is much less trouble to keep it in order, as the leaves being soft and succulent, and there being an absence of tough runners, and the growth less rapid, the mowing during the summer months takes about a quarter of the labour.

"2. The leaves being broader and the roots forming a thick fibrous mass, the surface is always well covered and stands more wear, as there are no bare places to be pitted into holes by the rain and wind. The leaves being of a softer texture it is unnecessary to grind the lip of a Green's lawn-mower, as much less resistance is offered to balls passing over it, and that resistance remains more even throughout the day.

"3. It eradicates all other grasses and weeds on my lawn. Wherever it appears the Couch disappears entirely, and at the present time (17th June), when what we call winter grass and many objectionable weeds are coming up in the Couch, the parts covered with Blue Couch are perfectly free from all other grasses.

"4. It stands the cold weather better; it is still green and growing whilst the Couch is looking brown and its growth has stopped. A severe frost turns it brown.

"5. It requires less top-dressing, and is better without any, if there are no subsidences in a lawn. Only sufficient to level the surface should be put on, as it does not require fresh soil to feed upon. A little fertiliser is quite sufficient.

"The only objections that I know of are:—Firstly, it dies off sooner during a long term of hot dry weather; but it recovers very quickly after rain, and as all lawns during such times have to be watered, it is only a matter of using a little more water, the cost of which is less than that of the extra labour required by Couch. Secondly, the colour of the grass, which is never a bright green, being a blue green in summer and yellow green in winter; but as it is all one colour, this is preferable to the numerous tints which are so often found in a Couch lawn—especially during the winter. . . . It spreads on the lawn, where it is rolled and mown frequently, slowly in all directions, and does not send out runners, although it appears to do so when it reaches loose soil."

As the discovery of a new grass suitable for lawn making in warm countries where usually *Cynodon Dactylon* has to be used for that purpose is of considerable value, it is important to inquire into the origin and the natural affinities of the grass. As to the former, Mr. Maiden says that the grass is supposed to be of American origin, and he refers it with some hesitation to "a variety (*brevispicatum*) of the common summer grass, *Panicum* (*Digitaria*) *sanguinale*." From a letter by Mr. Maiden it appears that the author of the varietal name is Vasey and also that no description of it was published. A specimen of the grass was received at Kew three years ago when it was identified with an unnamed specimen of a *Digitaria* from Tonkin. The investigation was not then carried further; but on the receipt of additional material in November last it was taken up again, resulting in the establishment

of its status as a native of New South Wales. In fact it was collected as long ago as 1823 by that indefatigable collector Dr. Sieber at Port Jackson. He distributed it in his "Agrostotheca" under No. 72 and Nees named it *Panicum gracile* (in Sprengel, Syst. Veg. iv. ii. 33), but changed it subsequently to *Panicum subtile*, possibly because there was already a *Panicum gracile* in the field. He calls it (l. c.), *Panicum subtile*, R. Br., but how he came to connect it with Robert Brown is not clear, as there is no evidence of Brown having known it. Steudel on the other hand quotes it as *Panicum subtile*, Sieb. ex Nees [Syn. Pl. Gram., p. 41]. Curiously enough Sieber's specimen and the name escaped Bentham, so that they are not accounted for in the Flora Australiensis ; nor in fact has the plant been collected again in Australia until quite recently. The reason why the species dropped so completely out of the agrostological literature was no doubt that it was never described properly and soon became lost in synonymy. Steudel in the 2nd edition of his Nomenclator Botanicus [1842], identified it with *Panicum distachyum*, while in his Synopsis Plantarum Graminearum, p. 41 (1854), it appeared under *Panicum bicorne*, as *P. subtile*, Nees in Sieb. Agr. N. Holl. no. 72, with this note "non differt (i.e. a *P. bicorni*), nisi racemis magis laxifloris, cf. *P. didactylon*, Kunth." There is no justification for its identification with *Panicum distachyum*, L. On the other hand, it is indeed indistinguishable from *Panicum didactylon*, Kunth (1833) = *Digitaria didactyla*, Willd. (1809). This was described from a plant collected by Bory St. Vincent in Mauritius in 1801 or 1802, and it has since been repeatedly collected in that island as well as in Réunion and Madagascar. We thus know it from the Mascarenes, Tonkin and New South Wales, and the probability is that it is more widely distributed throughout this area than its occurrence in herbaria would suggest. It may have been overlooked because it was mistaken for one of the more common tropical species of *Digitaria*, or indeed it may hide under one of the species described by Büse from the Malay Archipelago and not represented at Kew. Sieber either received it from Mauritius from his collectors Hilsenberg and Bojer or collected it himself during his short stay in that island early in 1823 and distributed it subsequently in his "Herb. Fl. Maurit." under no. 42. This number does not seem to have been named until Steudel in his "Nomenclator" (1841) referred to it as "*Panicum bicorne*, Sieber (Hrbr. Maurit. no. 42 et ? Kunth, En. i. 83)," an unfortunate identification, as Kunth's *Panicum bicorne* is based on *Paspalum bicorne*, Lam., an Indian grass of clearly different affinity, and has in any case priority over "*Panicum bicorne*, Sieb." Bojer in his "Hortus Mauritianus" (1837) has no *Digitaria didactyla*, whilst Baker in his "Flora of Mauritius and the Seychelles" enumerates it as *Panicum didactylum*, Kunth, without further comment.

We have therefore accounted for the following synonymy for the Blue Couch Grass of New South Wales.

Digitaria didactyla, *Willd.* Enum. Hort. Berol. (1809), p. 91—*Panicum gracile*, Nees in Sprengel, Syst. Veg. vol. iv. pars. ii. (1827), p. 33, non R. Br. —*Panicum subtile*, Nees in Flora (1828), p. 300 (nomen) —*Panicum didactylum*, Kunth, Rev. Gram. (1839)

I., p. 33—*Panicum bicorne*, Sieb. ex Steud., Synox. Pl. Gram. (1854), p. 41, non Kunth.

Hasskarl in Plantae Javanicae Rariores (1841), p. 12 also, refers to *Panicum didactylum*, Kunth, as a possible synonym of *P. bicorne*, Kunth, but his account of the plants referable or possibly referable to the species he is dealing with is so confused that no notice of his suggestion need be taken.

From the indication of the distribution of *Digitaria didactyla* in Sprengel's Systema Vegetabilium, vol. i. (1825), p. 270: "Ins. Mascaren. Nov. Holland," it might be inferred that the new Australian lawn grass was already then known and recognised; but there is no doubt that "Nov. Holland" was added owing to the supposed, but mistaken identity of *Digitaria didactyla* (Ins. Mascaren.) with *Cynodon tenellus* R. Br. (Nov. Holland), which latter is quoted l. c. as a possible synonym.

Dr. A. Zahlbruckner kindly informs me that in the herbarium of the Vienna Hofmuseum there are two sheets of Sieber's Agrostotheca no. 72 with labels in what appears to be Sieber's handwriting, one of them containing the indication "Nova Hollandia," the other "Port Jackson." Both had been named *Digitaria didactyla* by Hackel as well as by Mez. As no full description of *Digitaria didactyla* exists, it may be useful to add one in this place.

Digitaria didactyla, *Willd. A perennial grass*, growing in loose or dense tufts, 10–40 cm. high, when in flower, often throwing out long (up to 40 cm. and more) many-noded runners which root from the nodes and give rise to few or many intravaginal innovation-shoots and flowering culms, terminating finally in an ascending culm or fascicles of such culms. *Innovation shoots* often bulbously thickened at the base, at length branching from basal leaf-axils, thus forming new young tufts of culms. *Runners and culms* very slender, 0·5–1 mm. thick, more or less wiry, particularly the former, terete, glabrous; terminal and subterminal culms like the runners, usually many-noded, internodes with the exception of the upper ones, usually 1–2·5 cm. long or near the base shorter; culms arising farther back on the runners, much shorter and with fewer nodes, erect or suberect or, if shortly ascending, then often rooting from the lowest nodes, simple or sparingly branched below. *Sheaths* membranous, rounded on the back, tight, the lowest (usually two) of the innovation-shoots reduced to broad, apiculate, bladeless, villously hairy, whitish cataphylls, the following, like all the lower sheaths of the flowering culms and those of the runners short, more or less hairy, particularly at the nodes, at length withering away, the upper mostly elongated and glabrous, uppermost of flowering culms up to 6 cm. long, all the sheaths or most of them somewhat shorter than the full-grown co-ordinated internodes. *Ligules* hyaline, truncate, denticulate, up to over 1 mm. long. *Blades* narrow-linear, attenuate to a fine point, those of the runner and the culm-leaves under or not much over 1 cm. long, upper culm-leaves similar or much longer (up to 6 cm.), 1·5–2 mm., rarely to 3 mm., wide, flat, soft, glabrous, smooth, rarely hairy. *Peduncles* (uppermost culm-internode) at length long exserted from the uppermost sheath, from 6 to over 15 cm. long, filiform, erect. *Racemes*, usually 2, sometimes 3, rarely more, digitate, sessile or nearly so, 2–4·5 cm.

long, suberect or more or less obliquely spreading, very slender, pale green ; rhachis hardly wavy, under 1 mm. wide, green wings almost as wide as the whitish midrib, margins smooth or nearly so, internodes up to 1·5 (rarely 2) mm. long, pedicels paired, unequal, filiform, scaberulous, the primary one 1·5 to almost 2 mm. long, the other very short. *Spikelets* lanceolate, acute, 2 mm. long, pale green, adpressed to the rhachis. *Involucral glumes* : lower reduced to a very minute, rounded or ovate, nerveless, hyaline scale, upper oblong, obtuse or subacute, 1–1·5 mm. long, thin, 3-nerved, finely hairy ; hairs in bands along the margin and between the nerves, with a short point. *Lower (empty) floret : Floral glume* (valve) lanceolate, acute, 2 mm. long, 7-nerved, in the dry state grooved between the nerves with the inner grooves hardly wider than the lateral, more or less finely hairy along the margins, hairs adpressed or spreading with short points. *Palea* an almost microscopic hyaline 2-lobed scale. *Upper (fertile) floret : Floral glume* (valve) lanceolate, acute, almost as long as that of the lower floret, thin-papery, often tinged with purplish-blue, delicately 5-nerved, at length somewhat firmer. *Palea* similar in shape and structure to the floral glume, but delicately 2-nerved. *Lodicules* subquadrate, 0·15 mm. long. *Stamens* 3, anthers linears, yellow, about 1·5 mm. long. *Ovary* lanceolate ; styles capillary, up to 1·2 mm. long ; stigmas exserted from the apex of the floret, purple 0·75 mm. long. *Grain* unknown.

Distribution and specimens examined :—

Mascarenes. Mauritius, *Bory de St. Vincent*, *Dupetit Thouars* (a specimen in the British Museum, from Willdenow's Herbarium), *Sieber*, Fl. Maurit. ii., 42, *Bouton*, *Ayres ;* Réunion,* *Balfour*.

Madagascar. Central Madagascar, *Baron*, 4253 ; South Madagascar, Fort Dauphin, "prostrate, matted, sandy dunes," *Scott Elliot* ; without precise locality, *Gerrard*, 82.

Tonkin. Tankeuin, near Guang-yen, "croissant en touffes compactes . . . . . sur les rochers calcaires," *Balansa*, 460.

Australia. New South Wales, "Port Jackson," *Sieber*, Agrostoth. 72 ; Sydney, *Maiden*.

The affinity of the grass lies evidently with *D. sanguinalis*, L., from which it differs, however, sufficiently in its perennial duration and peculiar mode of growth, the fine blades, the small number of racemes and their slender build, the smaller spikelets and the evenly grooved appearance of the glume of the lower floret, at least when dry. To this might be added as a secondary anatomical character the smaller size of the wavy-walled cells of the glume of the fertile floret and their smaller number of folds (3–4) against those of *D. sanguinalis* (6–7). Although I have examined all the specimens mentioned above for grains, I have not found a single one, even in racemes which had already shed most of their spikelets and were to all appearances perfectly mature.

* "Dans les champs incultes," Cordemoy, Flore de l'Ile de la Réunion, p. 117.

XXXIV.—DIAGNOSES AFRICANAE: XLIII.

1271. **Oncoba Routledgei**, *Sprague* in Gard. Chron. 1911, vol. xlix. p. 323 anglice [Flacourtiaceae-Oncobeae]; glabritie foliorum et cursu nervorum lateralium *O. spinosae*, Forsk., stylo apice in ramos circiter 8 breves capitatos diviso necnon antheris brevibus *O. brachyantherae*, Oliv., accedens.

Frutex usque ad 6 m. altus, spinis axillaribus usque ad 2·5 cm. longis. *Folia* breviter petiolata, elliptico-oblonga vel oblonga, breviter obtuse acuminata, basi obtusa vel rotundata, 6·5–11·5 cm. longa, 3–5·5 cm. lata (in plantis juvenilibus pro rata angustiora), grosse crenato-serrata, fere glabra, exsiccando tenuiter coriacea; nervi laterales utrinque 5–6, satis obliqui, versus marginem excurrentes, subtus elevati; venae primariae quam ceterae multo magis distinctae, parallelae, sub angulo recto e nervo medio ortae, 1–2 mm. distantes. *Sepala* 4, sub fructu juvenili reflexa. *Petala* circiter 8. *Antherae* oblongae. *Stylus* apice in ramos circiter 8 breves capitatos divisus.—*Oncoba spinosa*, var. *Routledgei*, Hort. ex. Gard. Chron. 1911, vol. xlix. p. 236.

Tropical Africa. Uganda: Mt. Ruwenzori, 2400 m., *Dawe*, 650. British East Africa: Aberdare Mts., 1900–2100 m., *Battiscombe*, 51; Nyeri District, *W. S. Routledge*. German East Africa: Usambara; Gonja, *Holst*, 4217; Uluguru Mts., *Goetze*, 227.

O. Routledgei was raised by Mr. C. E. Shea from seed sent him by Mr. James Routledge and collected in East or Central Africa.

1272. **Hoffmanseggia Pearsonii**, *Phillips* [Leguminosae-Eucaesalpinieae]; affinis *H. rubrae*, Engl., sed ramis albescentibus distincte maculatis, pinnis utrinque 3–4-jugis, foliolis paucioribus, floribus multo minoribus maculatis differt.

Suffrutex 30 cm. altus. *Rami* laeves, juniores albo-tomentosi, nigro-glandulosi, demum cortice cinereo obtecti. *Folia* bipinnata, 2·8–4·3 cm. longa; rhachis tomentella, superne pilosa, nigro-glandulosa; foliola opposita, subsessilia, oblonga, utrinque rotundata, 4–7 mm. longa, glabra, nigro-glandulosa; stipulae lineares, 4–5 mm. longae, tomentosae, nigro-glandulosae, ciliatae; stipellae minutae. *Racemi* axillares, floriferi 2·5 cm. longi, fructiferi 13 cm. longi, circiter 12-flori; pedunculus breviter pubescens, nigro-glandulosus; pedicelli 2·5 mm. longi; bracteae minutae. *Calycis tubus* 1·5 mm. longus; lobi 6 mm. longi, lineares, minute pubescentes, nigro-glandulosi, decidui; anterior latior. *Corolla* 6 mm. longa, glabra. *Stamina* libera; filamenta 4·5 mm. longa, linearia, apice angusta, inferne ciliata; antherae 1 mm. longae, ellipticae. *Stylus* 2·5 mm. longus, teres, glaber, persistens, stigmate terminali. *Ovarium* subsessile, 9 mm. longum, subfalcatum, pilosum, dense nigro-glandulosum; ovula circiter 5. *Legumen* leviter pedicellatum, reflexum, compressum, falcatum, apice acutum, 2·5–2·7 cm. longum, 7 mm. latum, parce setosum, setis pilosis, nigro-glandulosum.

South Africa. Bechuanaland: between Chue Vley and Moshowing River, *Burchell*, 2400; Great Namaqualand: Club River Bed at Gobas, 1200 m., *Pearson*, 3747; Sandy River Bed at

Sandverhaar, 945 m., *Pearson*, 4652 ; river bed at Holoog, 760 m., *Pearson*, 4122.

Tropical Africa. German South West Africa : Okahandja, *Dinter*, 442.

1273. **Combretum tanaense**, *J. J. Clark* [Combretaceae] ; valde affinis *C. cuspidato*, Planch., sed folii acumine brevi obtuso subemarginato et disco minus conspicuo distinctum.

Frutex scandens, ramis novellis fusco-pilosis adultis glabris, cortice olivaceo. *Foliorum* petioli breves, minute griseo-pubescentes, 0·8–1 cm. longi ; laminae novellae glutinoso-lepidotae, exsiccando nigricantes, demum glabrae, coriaceae, multo pallidiores, lepidotae, obovato- vel elliptico-oblongae, basi rotundatae et minute cordatae, apice in acumen breve obtusum emarginatum productae, 8–15 cm. longae, 4–7·6 cm. latae ; nervis lateralibus subtus valde prominentibus circiter 9 adscendentibus arcuatim connectis, venis laxis angulis subacutis ortis. *Spicae* e foliis summis ortae, quasi in paniculam terminalem basi foliatam collectae, numerosae vel paucae, cylindricae, subdensae, omnibus inflorescentiae partibus fusco-velutinis ; bracteae lineares, 1 mm. longae, mox deciduae. *Receptaculum* extus glutinoso-lepidotum et dense fusco-pubescens, inferius fusiforme, 2 mm. longum, superius campaniforme, 1 mm. longum intus supra discum glabrum pilosum, obscure 4-lobum, lobis brevissime triangularibus. *Petala* breviter unguiculata, transverse elliptica, reflexa, 1 mm. longa, 1·2 mm. lata. *Stamina* exserta, filamenta 4·5 mm. longa. *Fructus* ignota.

Tropical Africa. British East Africa : Tana River, 90 m., *Battiscombe*, 237.

Scandent tree, growing close to the water's edge.

1274. **Sonchus Tysonii**, *Phillips* [Compositae-Cichoriaceae] ; affinis *S. rarifolio*, Oliv. et Hiern, caule pilis glanduligeris instructo, foliis bene evolutis setosis basi auriculatis, capitulis latioribus, involucri bracteis setoso-glanduligeris differt.

Planta 25–30 cm. alta, basi foliata. *Folia* elliptica, oblonga vel oblonga-oblanceolata, apice acuta vel rarius subacuminata, basi amplexicaulia, auriculata, 10–15·5 cm. longa, 2–6 cm. lata, margine irregulariter et acute repando-dentata membranacea, setosa, ciliata, nervis lateralibus utrinque circiter 10 patulis prominentibus intra marginem anastomosantibus. *Scapus* 15–25 cm. longus, nudus, capitula 5–8 gerens, glanduloso-setosus ; bracteae lanceolatae vel subulato-lanceolatae, acutae, 1·5–2·5 cm. longae, basi 4 mm. latae, dense glanduloso-setosae. *Capitula* breviter pedunculata, subcorymbosa, 2 cm. longa, circiter 20-flora. *Involucri bracteae* 2–3-seriatae, lanceolatae, sensim acuminatae, apice acutae, extus glanduloso-setosae, margine submembranaceae. *Receptaculum* planum ; paleae lineares, 3 mm. longae. *Pappi setae* albae, 1 cm. longae, graciles, minute barbellatae. *Corollae limbus* 1·6 cm. longus, apice dentatus, basi attenuatus, pilosus. *Antherae* 6 mm. longae, basi sagittatae ; filamenta 7 mm. longa. *Stylus* exsertus, 1·5 cm. longus, filiformis, ramis 2 mm. longis. *Achaenia* compressa, utrinque attenuata, 7 mm. longa, remote sulcata, minute puberula.

South Africa. Natal : Inanda, *Wood*, 1381. Griqualand East ; on slopes near Kokstad, *Tyson in Herb. Austro-Afric.*, 966.

1275. **Crotonogyne ikelembensis**, *Prain* [Euphorbiaceae-Crotoneae]; species *C. Poggei*, Pax, proxime accedens, sed foliorum forma, indumento pro parte lepidoto nequaquam setoso floribusque maris majoribus satis differt.

Frutex, ramulis lepidotis et stellato-pubescentibus. *Folia* alterna, sparsa, breve petiolata, chartacea, obovata, acuta, a triente summo versus basin subito late cuneatum angustata, margine integra parce setosa, 15–25 cm. longa, 5–9 cm. lata, supra saturate viridia, subtus pallidiora, utrinque glabra; nervi laterales utrinsecus 12–14; petiolus parce lepidotus et stellato-pubescens, 1 cm. longus, crassus; stipulae ovatae, acutae, parce lepidotae et stellato-pubescentes, 5 mm. longae. *Racemi* ad 35 cm. longi, simplices vel parce ramosi; rhachides lepidoti et stellato-pubescentes; flores masculi glomerati, glomeruli pauciflori, inferne 2·5 cm. superne 6–8 mm. remoti; pedicelli brevissimi; bracteae 2-glandulosae. *Calyx* maris globosus, minute apiculatus, in alabastro clausus, demum valvatim 3-lobus, raro 4-lobus, extra dense stellato-pubescens et parce lepidotus. *Corolla* alba, gamopetala, calyce brevior, tubo campanulato intus hirsuto, limbo distincte lobato lobis truncatis vel parum emarginatis. *Stamina* circiter 18, exteriora 5, glandulis extrastaminalibus in urceolum lobatum extra pubescens connatis circumcincta. *Flores feminei* ignoti.—*C. Laurentii*, var. *ikelembense*, De Wild. in Ann. Mus. Congo, Bot. sér. 5, ii. 278, t. 73, fig. 2; Dur. Syll. Fl. Cong. 490.

Tropical Africa. South Central. Congo State: Equatorial Province; Bombimba on the Ikelemba river, *Laurent.*

1276. **Crotonogyne impedita**, *Prain* [Euphorbiaceae-Crotoneae]; species *C. Laurentii*, De Wild., quam maxime affinis sed racemis masculis simplicibus, calyce maris fere glabro, corollaque maris margine subintegra facillime distinguenda.

Frutex 2–2·5 m. altus, ramulis stellato-pubescentibus. *Folia* alterna, sparsa, breve petiolata, chartacea, anguste oblonga, apice acute acuminata, basi abruptius in petiolum spurium subalatum quam petiolus verus 4–5-plo longiorem contracta, margine integra, glabra, 25–30 cm. longa, 6–9 cm. lata, supra saturate viridia, subtus pallidiora, utrinque glabra; nervi laterales utrinsecus 10–12: petiolus 6–8 mm. longus, densius stellato-pubescens; stipulae ovatae, acuminatae, 4 mm. longae, stellato-pubescentes et pilis rigidiusculis simplicibus hirsutae. *Racemi* 15–50 cm. longi, simplices; rhachides stellato-pebescentes; flores masculi glomerati, glomeruli pauciflori; feminei solitarii, pauci, versus apicem rhachidis; pedicelli masculi brevissimi, feminei primum 6 mm. demum 12 mm. longi, stellato-pubescentes; bracteae 2-glandulosae. *Calyx* maris globosus, minute apiculatus, in alabastro clausus demum valvatim 2-lobus, 2 mm. latus, extra pilis stellatis perpaucis exceptis glaber. *Corolla* alba, gamopetala, calyce brevior, tube campanulato intus hirsuto, limbo integro. *Stamina* circiter 10, exteriora 6, glandulis extrastaminalibus in urceolum crenulatum connatis circumcincta. *Calyx* feminei oblongus, parce lepidotus et dense stellato-pubescens, 4 mm. longus; lobi 5, anguste oblongi, obtusi, eglandulosi vel parce glandulosi. *Petala* 5, alba, imbricata, calyce longiora. *Discus* urceolatus. *Ovarium* dense stellato-pubescens et pilis simplicibus

rigidis setosum ; styli 3, singuli 3-partiti. *Capsula*, nimis juvenilis, stellato-pubescens et parce setosa.

Tropical Africa. Upper Guinea. Cameroons : Johann-Albrechtshohe, 200 m., *Buesgen*, 163 ; Lom, 200–300 m., *Ledermann*, 6397.

1277. **Crotonogyne lasiocarpa**, *Prain* [Euphorbiaceae-Crotoneae] ; species *C. impeditae*, Prain, affinis sed flore femineo tetramero stylisque singulis 7–8-partitis facillime distinguenda.

Frutex, ramulis lepidotis. *Folia* alterna, sparsa, breve petiolata, chartacea, oblongo-ovata vel oblanceolato-oblonga, acute acuminata, a triente summo versus basin acutum angustata, margine integra, glabra, 15–30 cm. longa, 5–11 cm. lata, supra saturate viridia, subtus pallidiora ibique parce lepidota ; nervi laterales utrinsecus 8–15 ; petiolus lepidotus, 1–3 cm. longus ; stipulae ovatae, acuminatae, lepidotae et parce stellato-pubescentes, 6–8 mm. longae. *Racemi* ad 24 cm. longi, simplices vel feminei parce ramosi ; rhachides lepidoti ; flores masculi glomerati, glomeruli pauciflori ; feminei solitarii versus apices rhachidis ramulorumque ; pedicelli masculi brevissimi, feminei primum 4 mm. demum 10 mm longi, lepidoti ; bracteae 2-glandulosae. *Calyx* maris globosus, minute apiculatus, in alabastro clausus, demum valvatim 2-lobus, extra dense lepidotus. *Corolla* alba, gamopetala, calyce brevior, tubo campanulato intus hirsuto, limbo breviter lobato. *Stamina* circiter 10, exteriora 6, glandulis extrastaminalibus liberis discretis circumcincta. *Calyx* feminei oblongus, dense lepidotus, 4 mm. longus ; lobi 4, anguste oblongi, subacuti, eglandulosi. *Petala* 4, alba, imbricata, calyce vix longiores. *Discus* alte lobatus. *Ovarium* lepidotum et pilis simplicibus rigidis setosum ; styli 3, singuli 7–8-partiti. *Capsula*, nimis juvenilis, lepidota et parce setosa.

Tropical Africa. Lower Guinea. Spanish Guinea : Akonangi, *Tessmann*, 947, 991, 1002.

1278. **Neoboutonia glabrescens**, *Prain* [Euphorbiaceae-Crotoneae] ; species *N. Mannii*, Benth., et *N. diaguissensi*, Beille, quam maxime affinis ab ambabus tamen pilis simplicibus elongatis omnino mancis facillime cognoscenda.

Arbuscula 3·5–4·5-metralis, ramulis parcissimo stellato-scrobiculatis. *Folia* distincte petiolata, membranacea, orbiculari-cordata, acuta, margine integra, 10–20 cm. longa lataque, laete viridia, utrinque secus nervos, venas, reticulationesque parce stellato-scrobiculata ceterum glabra ; petioli minute scrobiculati ; stipulae minutae, caducae. *Flores masculi* copiose paniculati, distincte pedicellati ; rhachides ramulisque panicularum parce scrobiculatae. *Calyx* glaber, in alabastro globosus, clausus, dein apertus 2 mm. latus. *Stamina* 15–20 ; filamenta gracilia, antheris longiora ; antherarum connectivi apice glandula singula, nonnunquam glandulis 2–3 cereis, minutis, deciduis instructi. *Flores feminei* in racemos copiose ramosos dispositi, parvi, 4 mm. longi, 6 mm. lati. *Sepala* triangularia, pubescentia, in tubum lobis longiorem connata. *Ovarium* 3-loculare ; styli 3, 2-partiti, lobis linearibus. *Fructus* ignotus.

Tropical Africa. Upper Guinea. Cameroons : Victoria ; Bimbia, *Preuss*, 1288 ; Kribi ; Bipinde, 400–480 m., *Zenker* 1527,

3202a. Yaunde ; Epfasa, 820 m., *Zenker*, 1430. Lower Guinea. Spanish Guinea : Nkolentangan, 450 m., *Tessmann*, B 133 ; Akonangi, *Tessmann*, 982.

1279. **Neoboutonia Melleri**, *Prain* [Euphorbiaceae-Crotoneae] ; species *N. africanae*, Muell.-Arg. et *N. canescenti*, Pax, quam maxime affinis ab ambabus tamen foliis parum rigidioribus, floribus masculis sessilibus vel fere sessilibus apte distinguenda.

Arbor 9–10-metralis ; ramuli tomento stellato rufo-cinereo scrobiculati. *Folia* distincte petiolata, firmula, orbiculari-cordata, acuta vel obtusa, margine integra, 10–20 cm. longa ac lata, laete viridia, supra secus nervos et reticulationes parce hirsuta tomento stellato et pilis longiusculis albidis, subtus ubique dense tomento perbrevi stellato continuo glandulis minutis applanatis intermixto induta ; petioli parce scrobiculati ; stipulae lineares. *Flores masculi* copiose paniculati, sessiles vel fere sessiles ; rhachides ramulique panicularum scrobiculati. *Calyx* in alabastro clausus, globosus, apicem versus hirsutus, dein apertus 3 mm. latus. *Stamina* 25–30 ; filamenta gracilia antheris manifeste longiora ; antherarum connectivi apice glandulis saepissime 3, nonnunquam 1, minutis, cereis, deciduis coronati ; glandulae extrastaminales 5, oblongae, truncatae vel emarginatae. *Flores feminei* racemosi racemis compositis, parvuli, 4 mm. longi, aperti 6 mm. lati. *Sepala* lineari-lanceolata, basi in tubum perbrevem connata. *Ovarium* 3-loculare, densius strigosum ; style 3, singuli 2-partiti lobis linearibus. *Capsula* 3-cocca, coccis 2-valvis, 8 mm. longa lataque, fusca, pubescens. *Semina* subglobosa, hilo facie interiore deorsum producto.—*N. canescens*, Pax in Engl. Bot. Jahrb. xix. 91 pro parte maxima sed spp. Schweinfurthiana excludenda : Engl. Pflanzenw. Ost.-Afr. C, 238 ; Dawe Rep. Bot. Uganda 56. *Mallotus Melleri* Muell.-Arg. in Flora, 1864, 468 ; DC. Prodr. xv. 2, 959 ; Dawe, Rep. Bot. Uganda, 56.

Tropical Africa. Nile Land. Uganda : Western Prov. ; Toro, on the banks of the river Nsongi, 1220 m., *Dawe*, 841 ; on the Bigera river, 1220 m., *Bagshawe*, 1130 : Ankole, 1520 m., *Dawe*, 445, 475. South Central. Congo State : Eastern Prov. ; Ruwenzori, 1220 m., *Mildbraed*, 2477, 2744. Mozamb. Dist. German East Africa : Bukoba, *Stuhlmann*, 1097, 1150, 1565, 1582, 3321, 3745 ; Kabotschi, *Fischer*, 527. Nyasaland : Zomba, *Whyte*, 91 ; Manganja Hills, *Meller* ; Shire Highlands, *Buchanan*, 12, 21, 344, 1498.

1280. **Neoboutonia velutina**, *Prain* [Euphorbiaceae-Crotoneae] ; species *N. africanae*, Muell. Arg. affinis sed foliis subtus velutinis nec appresse glanduloso-stellato-scrobiculatis ovarioque dense velutino facillime cognoscenda.

Arbor 15–19-metralis ; ramuli parce pilis stellatis glomeratis obtecti. *Folia* distincte petiolata, membranacea, orbiculari-cordata, acuta, margine integra, 10–20 cm. longa lataque, laete viridia, supra secus nervos pilis longiusculis albidis basi bulbosis vel ibi pilis brevioribus stellatis basi circumcinctis molliter pubescentia, subtus ubique tomento brevi stellato laxiusculo molliter velutina ; petioli breviter scrobiculati ; stipulae lineares, rigidiusculae,

persistentes. *Flores masculi* copiose paniculati, distincte pedicellati; rhachides ramulisque panicularum minute scrobiculatae. *Calyx* apice pubescens, in alabastro globosus, clausus, dein apertus 3 mm. latus. *Stamina* 20–25, filamenta gracilia antheris vix longiora; antherarum connectivi apice glandulis 3, raro 1, cereis minutis deciduis instructi. *Flores feminei* in racemos copiose ramosos dispositi, parvi, 4 mm. longi, 6 mm. lati. *Sepala* lineari-lanceolata, pubescentia, basi in tubum perbrevem connata. *Ovarium* 3-loculare, dense stellato-velutinum; styli 3, 2-partiti, lobis linearibus. *Capsula* 3-cocca, 6 mm. longa lataque, dense velutina.

Tropical Africa. Upper Guinea. Cameroons: Bamenda, 1670 m., *Ledermann*, 1924; Ntem, 970 m., *Ledermann*, 2049; Labane, 1060 m., *Ledermann*, 2242; Yakuba, 1340 m., *Ledermann*, 5484; Tukurua, 1280 m., *Ledermann*, 5567; Babadju, 1580 m., *Ledermann*, 5987.

XXXV.—GRAFT HYBRIDS*

(With Plates.)

W. J. Bean.

Although it is now between eighty and ninety years since *Laburnum Adami*, the first graft hybrid, appeared, the remarkable diversity of blossom borne on the one tree remains a perpetual source of interest and wonder. It is curious that its history is not by now better known. During the past Laburnum season, twelve to twenty specimens a week have been received at Kew to be named, mostly with an indication that the senders had not seen or heard of such a tree before. Letters have also appeared in the daily press on the same subject. It may, therefore, be worth while to recount the origin and history of *Laburnum Adami*, which, briefly, is as follows:—

In 1825, a nurseryman of Vitry, near Paris, named Jean Louis Adam, grafted the dwarf purple broom, *Cytisus purpureus*, on the common Laburnum. At the union of the scion with the stock there subsequently appeared a shoot which bore flowers of a purplish yellow, and, to all seeming, intermediate between those of the purple broom and the Laburnum. This was propagated and called after its raiser, and is the *Laburnum Adami* as we know it to-day. A few years after it had been distributed from Adam's nursery a further curious phenomenon was observed. It was seen that portions of the tree had a tendency to revert back to one or other of the "parent" species, so that a single tree would carry at one time three different sorts of flowers, viz., the purplish flowers of the presumed hybrid, those of *Laburnum vulgare*, and those of *Cytisus purpureus*. The tree has retained this remarkable characteristic until the present time. The branches that bear the flowers of true Laburnum and *Cytisus purpureus* are in every way characteristic of their respective species, which they reproduce quite true from seed

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* *See* E. Jouin in *Le Jardin*, 1899, p. 22 ("Le Néflier de Bronvaux"); and D. H. Campbell in *The American Naturalist*, vol. xlv., p. 41 ("The Nature of Graft Hybrids").

and from cuttings. *Cytisus purpureus* appears as a dense tuft of twigs suggestive of witch's broom. The hybrid has very much the general aspect and foliage of a Laburnum, but the raceme is shorter, the flowers are purplish, and, so far as I have observed, invariably sterile.

Crataego-mespilus Dardari, *Simon-Louis.*

During the May and June just past there has flowered at Kew a tree which shows much the same peculiarities as *Laburnum Adami*. It is known as *Crataego-mespilus Dardari* and is a graft hybrid between the common hawthorn (*Crataegus Oxyacantha*) and the medlar (*Mespilus germanica*). It first appeared on an old medlar tree growing in the garden of M. Dardar at Bronvaux near Metz, that had been grafted on a stock of hawthorn. A branch was noticed originating from just beneath the graft which showed characters intermediate between those of hawthorn and medlar. The leaves and fruits, although smaller, were those of the medlar, but the branches were spiny and the flowers appeared in corymbs as in the hawthorn. The branch was propagated in the nursery of Messrs. Simon-Louis of Metz, and the plants so obtained are now known as *C.-m. Dardari*. This is represented by the lowest branch in the illustration. (Plate 1).

Crataego-mespilus Asnieresii, *Simon-Louis.*

Issuing from nearly the same place on M. Dardar's tree at Bronvaux was another branch quite unlike the first but also intermediate between hawthorn and medlar. The leaves on this branch were lobed, and the flowers in form and arrangement resembled those of the hawthorn; but the leaves, branchlets and calyx were pubescent, as in the medlar. From this shoot was derived the trees now called *Crataego-mespilus Asnieresii*. The full-page Plate 2 represents the Kew specimen in flower—a tree of great elegance and beauty, and the uppermost spray illustrated on Plate 1 is also of this form. This second graft hybrid leans more towards the hawthorn, whilst *C.-m. Dardari* more resembles the medlar.

Since 1898, *C.-m. Dardari* has shown the same tendency to break up as *Laburnum Adami* has always done, and the three quite distinct flowering branches illustrated on Plate 1 were all gathered from the one Kew specimen on June 1, 1911. The uppermost branch is exactly identical with *C.-m. Asnieresii*, the middle one is pure medlar, and the lowest is *C.-m. Dardari* itself. The bulk of the tree remains true and there is at present only one branch of each of the other two on our tree. The whole phenomenon bears considerable analogy to that exhibited by *Laburnum Adami* except that only one of the parents is reproduced true. So far as I have observed no pure hawthorn has appeared on either *C.-m. Dardari* or *C.-m. Asnieresii*. In fact the specimen of the latter at Kew now figured has hitherto remained quite true to the hybrid type. It is, however, quite probable that it may at any time "sport" as *C.-m. Dardari* has done—may, indeed, have already done so in other gardens. It should also be mentioned that on M. Dardar's mother tree at Bronvaux a third branch appeared beneath the graft, which

1. Crataego-mespilus Dardari.

[*To face page* 268.

2. Crataego-mespilus Asnieresii.

To face page 269.]

at its base was pure hawthorn, but became transformed towards the extremity into what was identical with, or very near to, *C.-m. Asnieresii*.

As an ornamental tree *C.-m. Asnieresii* is much to be recommended, flowering freely and possessing an exceptionally graceful habit. *C.-m. Dardari*, whilst the more interesting in its marked tendency to sport, is not so attractive a tree.

A new interest has been aroused in the study of graft hybrids owing to the recent researches of Professor H. Winkler of Tübingen in grafting the black nightshade (*Solanum nigrum*) on the Tomato (*Lycopersicum esculentum*) and vice versa. The accounts of these experiments have been recently summarised in English by Professor D. H. Campbell*, so that it is unnecessary to refer to them in detail here. It seems clear however that in some cases the hybrids obtained by Winkler were of the nature of "periclinal" hybrids, that is to say, that the outer tissues of the shoot produced by grafting belong to one parent while the inner tissue are those of the other. Macfarlane† in his careful work on the structure of *Laburnum Adami* found that the epidermal tissues were strikingly like those of *C. purpureus* while the inner were like those of the Laburnum, and an investigation of the *Crataego-mespilus* hybrids has revealed a similar state of affairs.

Explanation of Plates.

1. Three sprays gathered from one specimen of *Crataego-mespilus Dardari* at Kew on June 1, 1911 : *C.-m. Asnieresii* (top) ; Medlar, *Mespilus germanica* (middle) ; *C.-m. Dardari* (bottom).

2. *Crataego-mespilus Asnieresii* at Kew, about 10 feet high, photographed June 1, 1911.

XXXVI.—DECADES KEWENSES

Plantarum Novarum in Herbario Horti Regii Conservatarum.

DECAS LXI.

601. **Osbeckia Hildebrandii**, *Stapf* [Melastomaceae-Osbeckieae] ; affinis *O. stellatae*, D. Don, sed foliis subtus densius pilosis, bracteis amplis, calycis indumento molli distincta.

Caulis acute quadrangularis, strigulosus. *Folia* ovata vel oblonga, acuta, basi subacuta vel rotundata, 10–20 cm. longa, 3·5–7 cm. lata, herbacea, supra saturate viridia, subadpresse hispidula, infra pallida, in nervis venisque hirta, 7-nervia, nervis venisque transversis admodum prominentibus, margine rigide ciliata, in costa utrinque glandulis purpureis breviter cylindricis vel globosis obsita ; petiolus

* Campbell, D. H. "The Nature of Graft Hybrids" in The American Naturalist, xlv., January 1911, pp. 41–53 ; *see also* Baur "Einführung in die experimentelle Verebungslehre," pp. 228–245 with figs.

† Macfarlane, J. M. "A comparison of the minute Structures of Plant Hybrids with those of their Parents and its bearing on Biological Problems," Trans. Roy. Soc., Edinburgh, xxxvii., 1895, pp. 203–286.

1–1·6 cm. longus. *Flores* in racemo demum elongato dense hirto-tomentoso, internodiis circiter 6 mm. longis; bracteae amplae, rotundae, alabastra velantes, dorso adpresse molliterque pilosae, fere 2·5 cm. longae; pedicelli robusti, 2–4 mm. longi. *Calyx* campanulatus; tubus sub anthesi 1·4–1·6 cm. longus, squamis appressis albo-hirsutis dense obtectus, squamis inferioribus minutis, summis subulatis purpurascentibus; lobi e basi latiore lineares, albi, 8 mm. longi. *Petala* rosea, obovato-orbicularia, 2–2·5 cm. longa. *Stamina* aurea; antherae basi antice et postice brevissime appendiculatae, longe tenuiter rostratae, sigmatoideae, 1·2–1·6 cm. longae, connectivo rubro. *Ovarium* in vertice hirsutum. *Semina* cochleata, 0·6–1 mm. longa, albo-granulata.

Burma. N. Shan States: Toungyi, *Mrs. Hildebrand*, 599–99, cult. Hort. Kew, 1901.

602. **Senecio** (§**Jacobaea**) **lancifer**, *J. R. Drummond* [Compositae-Senecioneae]; species insignis, propter capitula *S. Jacobaeam*, Linn., necnon *S. sarracenicum*, Linn., revocans, sed ab omnibus *S. Jacobaeae* affinibus foliis omnino haud incisis latis pergamantaceis et phyllariis paucioribus latioribus statim distinguenda.

Herba suffruticosa, 0·4–1·3 m. alta, caule robusto subflexuoso simplici exigue striato laevigato parum folioso. *Folia* radicalia oblongo-lanceolata, basi obliqua, petiolata, caulina pauca, lanceolata vel ovato-lanceolata, subsessilia vel in petiolum brevem manifeste alatum atque auriculatum amplexicaulem decurrentia, omnia obtuse acuminata, margine crenulato-dentata, nervo centrali prominulo infra incrassato, utrinque venis copiosis prominentibus pulchre reticulata, subcoriacea. *Capitula* subcampanulata, diametro 8·5 mm. attingentia, longe radiata, in corymbos 4–6 capitula ferentes longe-pedunculatos bracteis setaceis inconspicuis ornatos disposita, bracteolata; phyllaria 8–10, aliquando infra subconnata, oblongo-ovata vel subquadrata, obtusissime acuminata, apice subscariosa, colorata, uninervia, cum pedicellis saepius puberula. *Ligulae* ex ungue brevi oblongo-ovatae, apice retusae, obscure dentatae vel sub-integrae, 5–7-striatae, aureae; disci flosculi infundibuliformes, multo breviores. *Achaenia* cylindrica seu columnaria, supra truncata, subacute costata, glabra, pappo multiseriato albescente undulato satis longo scabro apice minute clavato plumoso donata.

Sikkim. *King's Collector*, 1882. Tibet. King's Collector, 1884; Gyangtse, *Walton*, 1904; Saogong, *H. M. Stewart*, 20 July, 1907; Lhassa, *Waddell*, 1904.

A fine *Senecio* of the *Jacobaea* section, with a twiggy stem, and parchment-like leaves which have the midrib prominent and greatly thickened on the under surface, strongly reticulated with prominent pale veins closely interlaced, but springing from a pinnate series of secondary nerves; the ultimate projections of the marginal vein-system running out through the lobules of the parenchyma as a blunt mucro; corymbs long-peduncled from the upper axils, with heads similar in size, colour, &c., to those of *S. Jacobaea*, Linn.; involucre rather narrow at the base where the phyllaries are often connate; phyllaries much broadened upwards, with a wide dark-green midrib and pale edges; achenes rather sharply ribbed, truncate at the summit, at the base contracted, smooth, scarcely compressed, on the disk even; pappus dull-white, wavy, with the

ends obscurely thickened, finely plumose, or minutely fimbriate. Named from the leaves, which are shaped like a spear-blade, and markedly different from the type which prevails in this section of the genus.

603. Senecio (§ Ligularia) rumicifolius, *J. R. Drummond* [Compositae-Senecioneae]; species notabilis, maxime ad *S. platyglossum*, Franch., approximans, a quo foliis latioribus obtusioribus, venis magis prominentibus petiolis versus basin inflatis dignoscitur.

Herba annua (?), bipedalis, caule simplici carnoso albescente glabro striato in spicam 20–30 cm. longam plus minus araneosam abeunte. *Folia* [radicalia desunt] inferiora modice petiolata, intermedia petiolis amplexicaulibus versus basin subinflatis ad 17 cm. longis suffulta, in laminam late oblongam basi deltoideo-cordatam apice rotundatam abrupte expansa, ultima sessilia, omnia margine serrato-denticulata, membranacea, venis in pagina inferiore prominulis reticulata, hic illuc araneosa, glabrescentia. *Capitula* anguste campanulata, nutantia, breviter pedunculata, ad 5 cm. elongata, circa 3·8 cm. lata, plus minus araneosa, in racemum arctum subsecundum spiciformem disposita, bracteolis lineari-setaceis longis superne araneoso-villosis extus munita. *Phyllaria* 7–10, obovata, apice obtusa, breviter et obscure mucronata, membranacea, striata. *Ligulae* totidem quot phyllaria, 3·8 cm. longae, ex ungue longo valde angustato in laminam ovato-spathulatam apice rotundatam obtuse 2–3-dentatam productae. *Achaenia* exteriora cymbiformia, costata, aliquando facie interiore canaliculata, interiora glabra subcompressa, omnia cupula manifesta pappum multiseriatum achaenio duplo longiorem candidum minute barbellatum ferente coronata.

Tibet. Yamdokcho, 4570 m., *Walton*.

This somewhat resembles Delavay's No. 3208, and *S. platyglossus*, Franch., but does not altogether match any *Ligularia* at Kew. The breadth and texture of the leaves are remarkable, as well as the almost spicate inflorescence, and the long-clawed ligules. The achenes of the ray are very peculiar, and in some there is a tuft of brown villi at either end of the groove on the inner face, which, if constant, would be a distinctive feature, but the material is insufficient for a decision whether this may not be due to a diseased condition. It is very near *S. platyglossus*, Franchet (in Bull. de Soc. Bot. de France, xxxix, 293), but the heads in the Yunnan plant seem to be smaller, the whole plant, and especially the raceme, far less cobwebby, while the leaves in Capt. Walton's species are broader, more obtuse, and more prominently reticulate, on the under surfaces especially. Neither in the specimen from the Delavay collections, nor in Franchet's description, is there indication of the inflated base of the petiole which is so conspicuous in the Yamdokcho *Ligularia*.

604. Senecio (§ Synotis) pelleifolius, *King MSS.* ex *J. R. Drummond* [Compositae-Senecioneae]; species e grege *S. quinquelobi*, Hook. f. et Thoms., a *S. Zuccarinii*, Maxim., atque *S. Przewalskii*, Maxim., quibus manifeste affinis, foliorum nervis primariis e costa media cordato-palmatim, nec angulo acuto orti; a *S. quinquelobo* foliis pinnatifidis aliisque notis bene distinguitur.

Herba perennis, glabra vel sparse et minute huc illuc pubescens' radice abbreviata, fibris crebris praedita. *Caulis* simplex, tenuis, erectus, flexuosus, leviter striatus. *Folia* petiolata [radicalia desunt, an marcescentia ?], membranacea, in pagina superiore viridia, scaberula, in inferiore pallida pulchre reticulata, puberula, utrinque venis palmatim editis (pagina inferiore praecipue manifestis) ornata, cordato-deltoidea, pinnatifido-lobata, lobo terminali alte tridentato, lateralibus oblique cuneato-pinnatifidis, lamina circiter 7–6 cm. longa et ad basin idem lata, petiolis foliorum inferiorum ad 5 cm. longis, summorum fere obsoletis, omnia gradatim diminuta. *Capitula* attenuata, cylindraceo-campanulata, circa 1·7 cm. longa, pedicellis brevissimis filiformibus minute bracteolatis sustenta, subsecunda, plus minus nutantia, vel late patentia, circiter 7-flora, secus caulem ad 22·5 cm. vel minus racemose disposita. *Phyllaria* quatuor, ligulato-lanccolata, externe minute puberula, erecta, apicibus paullo recurvatis. *Flosculi* omnes tubulosi, tubo angusto, limbo longe campanulato, pallentes. *Antherae* brevissimae, caudatae, conspicuae. *Achaenia* subcylindracea, satis longa, glabra, pappo candido sericeo minute barbellato donata.

Tibet. Chumbi valley, Tang-shang : at about 3660 m., *Dungboo* ; Do Tho, July 30th, 1877, *King*, 4683.

Sir George King remarks " Amongst the species described in the Fl. Brit. Ind. this would fall between *S. quinquelobus*, Hook. f. and Thoms., and *S. chenopodifolius*, DC. It is also allied to *S. Zuccarinii*, by its deeply palmifid leaves." The inflorescence in *S. Zuccarinii*, Maxim., is very different, except in depauperated examples, but the present plant may be a reduced state of a paniculate form also. From all states of *S. Zuccarinii*, however, as well as from *S. Przewalskii*, Maxim., this is at once distinguished by the venation of the leaves, which in King's species is cordato-palmate, or later broadly sagittate ; in the other two the branches are given off at an acute angle, with a much more widely curved periphery. *S. quinquelobus*, Hook. f. and Thoms., is very close to *S. pelleifolius*, but the heads in the former are more numerous and smaller, the inflorescence more branched and frequently cleistogamous, and the leaves are not pinnatifid. *S. acerifolius*, C. Winkl., which has leaves of a somewhat similar fashion, belongs to a different section of the genus.

605. **Gerbera Lacei**, *Watt* [Compositae — Mutisiaceae] : affinis *G. macrophyllae*, Benth., sed foliis cordatis lobis basalibus rotundatis facile distinguitur.

Herba perennis, acaulis. *Folia* radicalia, petiolis 4–17·5 cm. longis albo-tomentosis, laminis 5·5–16 cm. longis 3·5–8·5 cm. latis cordato-ovatis vel cordato-oblongis obtusis vel subacutis levissime sinuatis vel minute denticulatis supra glabris subtus albo-tomentosis. *Pedunculi* erecti, 14–60 cm. longi, albo-tomentosi, ebracteati. *Capitulum* solitarium, radiatum, 2·5–3·8 cm. diametro, album. *Involucri* squamae sub-4-seriatae, lanatae, exteriores angustissime linearisubulatae, interiores 1·0–1·6 cm. longae, 1·5–2 mm. latae, lanceolatae, acutissimae, ciliatae. *Flores* radii involucro longiores. *Achaenia* pubescentia. *Pappi* setae scabrae, pallidissime fulvae.

North-West India. Bashahr State : Baturing Forest, in the Baspa valley, 2440 m., *Lace*, 364 ; Nachar Forest, 2590 m., *Lace*, 935. Chamba State : Chitrari Forest, 1800–2130 m., *Lace*, 1712.

606. **Styrax mollis**, *Dunn* [Styracaceae]; affinis *S. confuso*, Hemsl., sed foliis subtus mollibus distincta.

Arbor parva; ramuli teretes, fusci, apice tomentosi. *Folia* alterna, ovata, acuminata vel acuta, basi breviter cuneata, 5–6 cm. longa, 3 cm. lata, crebre obscure glanduloso-serrata, subcoriacea, supra sparse infra dense et molliter stellato-tomentosa, venis primariis 6–7-jugis infra paullo prominentibus, petiolis brevissimis 1–2 mm. longis. *Racemi* in fructu tantum visi, defoliati, ad 14 cm. longi, tomentosi, glabrescentes; pedicelli 1–1·5 cm. longi. *Calyx* late cupulatus, truncatus, obscure dentatus, 5 mm. longus, exigue tomentosus. *Fructus* 1·0–1·2 cm. longus, globosus; pericarpium irregulariter ruptum, crasse coriaceum, tomentosum, in siccitate rugulosum. *Semen* unicum, ellipsoideum, brunneum, rugulosum, hilo latiusculo.

China. Kwangtung: Lo Fou Shan at 270 m., Aug. 11, 1883, Hongkong Herb. 105.

607. **Styrax roseus**, *Dunn* [Styracaceae]; affinis *S. Hemsleyano*, Diels, sed foliis gradatim acuminatis et calycis dentibus minimis differt.

Arbor parva, 2–3 m. alta; rami teretes, fusci, apice puberuli. *Folia* alterna, oblongo-ovata, gradatim acuminata, basi rotundata, 6–9 cm. longa, glanduloso-serrulata, papyracea, praeter venas utrinque pilis albis simplicibus et simul pilis rubris stellatis et praeter eorum axillas barbatas glabra, venis primariis 5-jugis infra paullo prominentibus, petiolis 3–4 mm. longis. *Racemi* axillares, pauciflori, in parte inferiore foliosi, 5–6 cm. longi. *Flores* 2 cm. longi, pedicellis 2–3 mm. longis. *Calyx* cupuliformis, 6–8 mm. altus, margine truncatus, obscure denticulatus, stellato-tomentosus, in parte basali siccitate aurantiacus, papyraceus. *Corolla* 5-partita, tubo 5 mm. longo, lobis valde imbricatis 12 mm. longis roseis 5–6 mm. latis utrinque tomentellis. *Stamina* 10, corollae lobis paullo breviora; antherae marginesque filamentorum pilis stellatis paucis ornatae. *Ovarium* multiovulatum, cum styli basi albo-tomentosum. *Fructus* non visus.

China. Szechuen: Mt. Wu, at 2600 m., *Wilson* 4065.

608. **Aristolochia punjabensis**, *Lace* [Aristolochiaceae]; affinis *A. saccatae*, Wall. var. *dilatatae*, Hook. f., sed foliis minoribus minus elongatis et floribus multo minoribus differt.

Herba volubilis vel procumbens, caule primum retrorso-pubescente demum glabro. *Foliorum* petioli 1–1·8 cm. longi, dense subtomentoso-villosi; laminae 2·5–10 cm. longae, 1·6–5 cm. latae, cordato-ovatae, acutae vel obtusae, utrinque molliter pubescentes. *Flores* axillares, solitarii. *Pedunculi* cum ovariis 2·5–5 cm. longi, breviter villosi, inferne cordato-bracteati. *Calyx* extra subtomentoso-villosus, intra (basi excepta) glaber; tubus 4·6–5 cm. longus, usque ad medium inflatus, deinde abrupte refractus et angustatus; limbus obliquus, 1·8–2 cm. latus, suborbiculatus, obscure 3-lobatus, atropurpureo-venosus. *Stamina* 6, trifasciculata.

North-west India. Chamba State: Bre Forest, 1980 m., *Lace*, 1543; Gothan Forest, 1830 m., *Lace*. Kangra District: Kotharna, 1980 m., *Hart*, 531. Flowering in April and May.

This distinct species is nearest allied to a plant that has hitherto been placed as a variety of *A. saccata*, Wall., which has been

separated below under the name *A. dilatata*, but from which it is abundantly distinct in having smaller and less elongated leaves and flowers only about half as large.

609. **Aristolochia dilatata**, *N. E. Brown* [Aristolochiaceae]; species *A. saccatae*, Wall., affinis, sed floribus axillaribus solitariis differt.

A. saccata, var. *dilatata*, Hook. f., in Fl. Brit. Ind. v, pt. i, p. 77.

North-west India. Kumaon; Ramgunga Valley, 2440 m., *Winterbottom;* Madhari Pass, 2440 m., *Strachey and Winterbottom;* without precise locality, *Blinkworth* (Wall. Cat. 2707 B).

This plant, together with two other species, is included under *A. saccata*, Wall., in the Flora of British India. The true *A. saccata*, Wall., besides having different leaves, produces its flowers in clusters on the old leafless part of the stems, whilst in *A. dilatata* (as in *A. punjabensis*, Lace), they are solitary in the axils of the leaves on the young shoots.

610. **Siphonochilus**, *Wood et Franks*, gen. nov. [Scitamineae-Zingibereae]. Indole *Kaempferiae*, L. praeter flores polygamos monoicos.

Flos ♂ *Kaempferiae. Flos* ♀ : *staminodia* in tubum angustum longum connata, 4–6-lobata; segmenta inaequalia. *Stamina* O. — Flores *pedunculati, vel brevissime racemosi; pedunculi et ovaria subterranea.*

Siphonochilus natalensis, *Wood et Franks* (species unica). *Herba* perennis. *Rhizoma* subglobosum, 4–8 cm. diametro, aromaticum; radices filiformes. *Caulis* foliosus, 6–8 cm. altus. *Folia* 5–10; petioli vaginati, caulem spurium reddentes; laminae lanceolatae, medio amplissimae, 30–35 cm. longae, 6–9 cm. latae, demissimae 7–9 cm. longae, 2–3 cm. latae, costa subtus prominente. *Flores* 3–6, speciosi, e rhizomate orti, pedunculati, solitarii vel brevissime racemosi, basi bracteati; bracteae oblongae, obtusae, 2–3 cm. longae, 0·8–1·5 cm. latae; pedicelli 1·2–2·5 cm. longi; pedunculi, bracteae, pedicelli et ovaria subterranea. *Flos hermaphroditus: Calyx* tubulosus, tridentatus, membranaceus, albus, 2·5–3 cm. longus, triente superiore unilateraliter fissus. *Corollae* tubus 2–2·5 cm. longus; lobi 3, lanceolati, acuminati, 6·5 cm. longi, 1·5 cm. lati, membranacei, albi. *Staminodia* petaloidea, rosea, amplissima; labellum cum staminodiis 2 erectis lateralibus 5 cm. longis 3·75 cm. latis in tubum fissum 6·5 cm. longum connatum, bifidum, 5·5 cm. longum et latum. *Stamen* 5 cm. longum; anthera linearis, 2-locularis, 1·2 cm. longa, connectivo ultra loculos in cristam dentatam 2–3 cm. longam 1–1·2 cm. latam producto. *Ovarium* 3-loculare, loculis ∞ ovulatis; stylus filiformis; stigma ultra loculos antherae crateriforme, apice 3-lobatum. *Flos foemineus: Calyx* et corolla florum hermaphroditorum. *Staminodia* in tubum cylindricum 8 cm. longum connata, 5–6-lobata; segmenta 4–6, inaequalia, 2–3 oblonga, obtusa, 5–6 cm. longa, 2·5–3 cm. lata, alterna 2–3 angusta, 5–6 cm. longa, 0·8–1 cm. lata. *Stamen* 0. *Pistillum* floris hermaphroditi.

Natal. Inanda, 540 m., *J. Medley Wood*, 544; Zululand, 'Ngoya, 450–610 m., *Wood*, 11,723.

Brought from 'Ngoya by the Curator, Mr. Wylie, and flowered in the Botanic Gardens, Durban, in December, 1910.

This genus differs from *Kaempferia* by its polygamous flowers, and from all species of *Kaempferia*,—*K. Ethelae*, J. M. Wood, only excepted—by the ovaries being beneath the surface of the ground. A large number of the plants have been under observation during the flowering season, but very few perfect flowers have been noted, the female flowers largely outnumbering them, and in no case so far as we have been able to find, have seeds been produced, the ovaries rotting in the ground, though the flowers are visited by a minute "Mucid" fly, the name of which we have not been able to ascertain. The tube of the female flowers is very narrow and long, so that fertilisation can only be effected by a very minute insect, and the flowers only remain open for the first half of the day, being completely closed before the evening. The late Mr. W. T. Gerrard, who first collected this plant, noted that the flowers were unisexual (Botanical Magazine, t. 5994). The plant was afterwards named by Dr. Schlechter from Wood's 544, and was by him and K. Schumann named *Kaempferia natalensis*, and they stated that if male flowers had been seen they would have proposed to "give it the dignity of a new genus," for which they suggested the name *Siphonochilus*. That name we have retained, though no male flowers have been seen, female and perfect ones only.

XXXVII.—MISCELLANEOUS NOTES.

Mr. H. N. Ridley.—We note with pleasure, in the list of Coronation Honours that Mr. H. N. Ridley, F.R.S., Director of the Botanic Gardens, Singapore, has been appointed a Companion of the Most Distinguished Order of Saint Michael and Saint George.

Dr. Harry Bolus, the doyen of students and collectors of the rich flora of Cape Colony, died of heart failure at the age of 77 on Thursday, May 25th, at Oxted in Surrey. He was born at Nottingham in April, 1834, and went out to the Cape at the age of 16. At first he settled at Graaff Reinet in the very centre of the colony, but about 1874 he removed to Cape Town and took up his residence in the suburb Kenilworth. By energy and perseverance Dr. Bolus accumulated a large fortune and has been a liberal patron of botany and education. He founded the Bolus Professorship of Botany in the South African University at Cape Town, of which the first and present occupant is Dr. H. H. W. Pearson. By the terms of his will £48,000 will ultimately fall to the University for scholarships and similar purposes. It is also understood that his valuable herbarium and rich library is left conditionally to the South African College to be in charge of his niece, Miss Louisa Kensit, who of late years has devoted herself to Botany and worked entirely with Dr. Bolus in all his botanical researches.

Shortly after taking up his residence at Graaff Reinet he became acquainted with Mr. Tuck, Professor MacOwan and Professor Guthrie. While at Graaff Reinet he took a great interest in succulent and bulbous plants and sent many of them alive to Kew.

Originally his only European botanical correspondent was Dr. Harvey, but after the death of the latter he commenced to correspond (in 1867) with Kew and continued this correspondence during the whole of his botanical career. His first visit to the Royal Botanic Gardens was made in the summer of 1876, when he brought a large collection of Cape plants for comparison with the Kew material. He gave duplicates of almost all he brought to Kew. These duplicates are now practically all that remain of that collection, for on his return to Cape Town in the "Windsor Castle" the ship was wrecked in Table Bay and he lost all his specimens, and the fruits of his visit were wasted. This was a great disappointment to him, but it did not damp his enthusiasm. The above was not the only accident that befell him, for on one occasion, during his absence from home, his entire herbarium ran the risk of being destroyed by fire, but owing to the devotion of his wife his herbarium and library were saved from the flames.

Dr. Bolus did a large amount of botanical work, principally on the Heaths and Orchids of the Cape. He elaborated the Heaths, with the help of his friend Dr. Guthrie, for the fourth volume of the Flora Capensis. This was a very difficult task, as the species number nearly 5,000 and many of them have been hybridised in gardens and a great many of the older descriptions are very incomplete. The death of his friend Dr. Guthrie, while collaborating in this work, was very keenly felt by Dr. Bolus.

About the year 1878 he commenced work on the Cape Orchids as a special study and for these he rapidly developed a great and lasting interest. At the commencement he found great difficulty in their determination, so with a view to assisting himself and others, when he again visited Kew in 1881, he prepared a list of South African Orchids with references which was published in Journ. Linn. Soc. in 1882, vol. 19, p. 335. Of the Orchids found in the vicinity of Cape Town he soon commenced to make drawings from the living plants, with a view to their ultimate publication, an idea that was realised by the publication of his "Cape Orchids" in 1888, containing 36 coloured plates, followed in 1893 and 1903 by parts 1 and 2 of his "Orchids of South Africa," each containing 50 plates. A third part containing 100 figures and descriptions has just appeared, the final proof being corrected by him the day before his death. He has left figures and descriptions of 75 more species, which it is to be hoped will be published before long.

In 1884 Dr. Bolus and Professor MacOwan commenced to issue their "Herbarium Normale Austro-Africanum," of which the advance sets were sent to Kew for correct determination before being issued to other herbaria, this practice being discontinued after the issue of the first 1000 numbers. About 1893, owing to some difference of opinion MacOwan continued the issue, unaided, under the title of Herbarium Austro-Africanum. These valuable sets were presented free to the six principal European and American herbaria.

In 1870 the Surveyor General of the Cape published an excellent map of Cape Colony. Some years after Dr. Bolus published an edition of this dividing out the country into botanical districts.

These districts were adopted with slight modifications in the continuation of Harvey & Sonder's Flora Capensis, edited by Sir W. T. Thiselton-Dyer and still in progress. In 1886 he contributed to the official handbook a "Sketch of the Flora of South Africa," and in 1905 he published an amended "Sketch of the Floral Regions of South Africa." In 1903 Dr. Bolus drew up in collaboration with Major Wolley-Dod an annotated list of the plants of the Cape Peninsula, the flora of which is extremely rich. In 1873 Dr. Bolus was elected a Fellow of the Linnean Society. The University of South Africa conferred the honorary degree of D.Sc. on him in recognition of his scientific work and of his liberality in endowing the Professorship. His name has been commemorated by Mr. Bentham in the genus *Bolusia* of the tribe *Galegae* in *Leguminosae*, and many species have also been named in his honour, including *Drimia Bolusii*, *Haworthia Bolusii*, *Cheilanthes Bolusii*.

His remains were interred after a very simple service, according to his wishes, in the Oxted churchyard.

The following letter received by the Director from Professor Pearson expresses the esteem in which Dr. Bolus was held in South Africa :—

"The news of the death of Dr. Bolus, which came by cable on Friday, has very much shocked his friends here. When I saw him off at the docks, a month ago, he told me that he felt he might never return. But that he should have died so shortly after his arrival in England, I suppose before he had time to see many of his friends, is particularly sad. I have felt for some time that he was becoming unattached to this country, and, in fact within the last two years he had frequently talked of the possibility of returning to end his life in England.

"He has done a wonderful work here, and his loss will be severely felt, and not merely among the few who are interested in Botany. His influence was very much greater than he realised, and it would be very difficult to define its nature. He took very little active part in public affairs of any kind, and even in matters in which the mere expression of his opinion would carry great weight, it was sometimes difficult (especially in recent years) to persuade him to support a cause in which he felt keenly interested. I think he was known chiefly through a few of his published writings—"The Orchids and the Heaths" more particularly—and through his letters, for he had a great number of correspondents at one time or another. His name was known from one end of the country to the other. As a man of business he was known for his strict integrity ; as a botanist his enthusiasm and energy and his willingness to help the many isolated workers who kept in touch with him have done, perhaps, more than anything else to establish Botany in this country. To me he has been the kindest of friends ever since I came here. All that he stood for in the country, especially with respect to the science he has made so signally his own, we shall not know until we have learned what it is to do without him."

Presentation by Mrs. Beddome.—Mrs. Beddome has very kindly presented to Kew the collection of dried Ferns, and Fern allies made by the late Colonel Beddome in India. The collection contains the material collected by him in Southern India, and that sent to him by various correspondents in other parts of India in connection with his well known works on "Indian Ferns." The presentation of Colonel Beddome's herbarium makes a valuable addition to the Kew collections.

Presentations to Museums.—The following miscellaneous specimens have been received in addition to those previously recorded in the Bulletin :—

Sir John Stirling Maxwell, Bart., Pollokshaws, N.B.—Plants of young Sitka Spruce (*Picea sitchensis*) and of *Pinus montana*, var. *uncinata* grown at an elevation of 800 feet. These were forwarded to illustrate the advantages of planting on raised turves on boggy land. Other plants were also received of the same species grown on unprepared land, together with photographs bearing upon the subject. (See *K. B.* No. 5, 1911, pp. 226–228).

The Agent-General for Western Australia.—Log of Jarrah (*Eucalyptus marginata*) from Western Australia. This has been placed in position in the Timber Museum (No. 3).

Mr. H. B. Rogers, Hexworthy, Launceston.—Specimens and photographs of *Cupressus Lawsoniana* and *Thuja plicata*, showing injury caused by squirrels.

Rev. Canon Ellacombe, Bitton Vicarage, Bristol.—Illustrations of varieties of Citrus fruits and of Persimmons (*Diospyros Kaki*) cultivated in Japan.

Prof. Bayley Balfour, F.R.S., Royal Botanic Gardens, Edinburgh.—Rope made of fibre of *Apocynum Hendersonii.*

Botanic Gardens, Singapore.—Fasciated stem of *Martinezia caryotaefolia.* Horned Cocoanuts. Branching stem of *Chrysalidocarpus lutescens.* Section of stem of *Hevea brasiliensis* showing healing of wounds caused by tapping for rubber. Branch of *Eugenia grandis* attacked by *Loranthus pentandrus.* Portion of stem of *Thunbergia laurifolia.*

Dr. C. S. Dolley, Mexico, per Sir Reginald Tower.—Stems of "Jumete," "Canelillo" or "Candelillo" (*Pedilanthus pavonis*) from Culiacán, Sinaloa, Mexico ; of "Cordoban" (*Pedilanthus tomentellus*) Tehuacan, Puebla, Mexico, and of "Candelilla" (*Euphorbia antisiphylitica*) from Coahuila, Mexico.

Sir W. S. Church, Bart., Harley Street, London.—Two sections of the trunk of an Oak, showing abnormal development.

The Right Honourable the Earl of Essex, Cassiobury Park, Watford.—Sections of the trunk of *Gymnocladus canadensis.*

The Right Honourable the Earl of Darnley, Cobham Hall, near Gravesend.—Sections of timber of Ash, Elm, Sweet Chestnut, Hornbeam, Deodar, Tulip tree, and of Cluster or Maritime Pine.

Miss Cleghorn, Calcutta.—Photograph of a branching Date Palm (*Phoenix sylvestris*).

Mr. A. D. Cotton, Kew.—Specimens of *Colpomenia sinuosa*, collected at Studland. This is a Mediterranean Seaweed, first observed on British Shores in 1905.

Messrs. Adolf Bleichert & Co., Bishopsgate Street, London.—Series of photographs to illustrate the transport of timber by means of aerial ropeways.

Mr. P. Masson, Edgeworth, Belvedere.—Photograph of Balsam Poplar with aerial roots.

Miss Webb, Stroud Road, Gloucester.—Skeletonised leaves of Poplar.

Mr. W. R. E. Coles, Adelaide Buildings, London Bridge.—Section of wood of *Platanus acerifolia* from a tree which was blown down in the churchyard of St. Michael, Crooked Lane, London.

Messrs. Paul Walser & Co., Ltd., Cripplegate Buildings, London.—Collection of materials of vegetable origin employed in millinery.

Messrs. Trewhella Bros., Smethwick, Birmingham.—Australian Monkey Jack used in tree felling.

Mr. E. Percy Rogers, Brampton Bryant, Herefordshire.—Shoots of Douglas Fir injured by caterpillars which had migrated from oak.

J. M. H.

Botanical Magazine for June.—The plants figured are *Cattleya Rex*, O'Brien (t. 8377); *Columnea gloriosa*, Sprague (t. 8387); *Prostanthera pulchella*, Skan (t. 8379); *Pteronia incana*, DC. (t. 8380); and *Saussurea Veitchiana*, Drummond and Hutchinson (t. 8381).

The *Cattleya*, a handsome species with white perianth and crimson and orange-red labellum, was discovered by Mr. Bugeroth, in the Peruvian Andes, and introduced to cultivation by Mr. L. Linden, of Brussels. The plant figured, which flowered at Kew, was purchased from Messrs. Sander and Sons, St. Albans, who recently obtained a fresh consignment of plants from Moyobamba. It is most nearly allied to *C. maxima*, Lindl.

Columnea gloriosa is a remarkably fine species, with its large, widely-open, scarlet flowers. It is a native of Costa Rica, and the plant from which the figure was drawn was purchased in 1909 from Messrs. Haage and Schmidt, of Erfurt. It is most nearly allied to *C. microcalyx*, Hanst., but is readily distinguished by its spreading calyx and the hairy, convex leaves from all other species in cultivation.

The *Prostanthera* was presented to Kew by Mr. T. A. Dorrien-Smith, of Tresco Abbey, Isles of Scilly, in 1908, and we owe its introduction to Capt. A. A. Dorrien-Smith, who brought the plants with him from the Antipodes. It is a native of Australia, and a distinct, hitherto undescribed species which does not readily fall into any of the sections of this large genus. The small violet flowers and *Boronia*-like habit make it a worthy subject for cultivation in a cool house.

Pteronia incana is a small grey-leaved glutinous South African shrub. The yellow flowers are borne in small axilliary capitula, and

are deliciously perfumed like mignonette. In the gardens of the Riviera it is a favourite plant, and the subject of the illustration was sent to Kew by Lady Hanbury, from La Mortola, Ventimiglia.

Saussurea Veitchiana is a striking plant, introduced to cultivation by Mr. E. H. Wilson, when collecting for Messrs. J. Veitch and Sons. Plants were raised from the seeds collected at Fang in Central China, and from one of these, presented to the Royal Botanic Gardens, Glasnevin, in December, 1904, came the material from which the plate is prepared. The flowers are a dull ruddy purple, a colour assumed also by the upper bracts, and the closest ally to this plant is *S. iodostegia*, which shows the same character in its bracts.

New Zealand Plants.*—To all those interested in the Flora of New Zealand, we would commend Dr. Cockayne's little book. He has succeeded in producing a popular work on scientific lines which should be of great value to lovers of nature and botanists, not only in New Zealand, but also in this country. The illustrations alone render the book a valuable addition to the botanist's library. The opening chapter deals shortly with general considerations of New Zealand as a biological region, and of the relations of its flora to South America and Australia. This is followed by a short account of the botanical history and chapters on the forests, shrubberies, coast vegetation, meadows, &c.

An account of the naturalised plants, numbering some 530 species, forms one of the most useful portions of the book. In the concluding chapters the story of some of the common New Zealand plants is told and makes very interesting reading, and lastly suggestions for the cultivation of the New Zealand plants are given which, in connection with the rest of the book, should do much to stir up enthusiasm in the country for the creation of gardens of native rather than of introduced plants. In this chapter (p. 168) he sums up the essence of scientific gardening so well that we quote it verbatim :—

" It must have been seen by the reader that one particular species may grow in most diverse stations, and that another may grow in a wet place which is physiologically dry. For instance, because a plant grows in a sphagnum bog, it would not necessarily be wise to plant it in a very wet part of the garden. To attempt to grow the lovely *Olearia semidentata*, of the Chathams, in such a place, would be to court disaster ; it must be grown in well-drained ground where there is good shelter. Nor because the great forget-me-not, of the same group, is a sea-shore plant, need one despair to cultivate it inland. In short, an aquaintance with natural conditions combined with experimental planting is a necessity for a full knowledge as to the cultural requirements of our plants."

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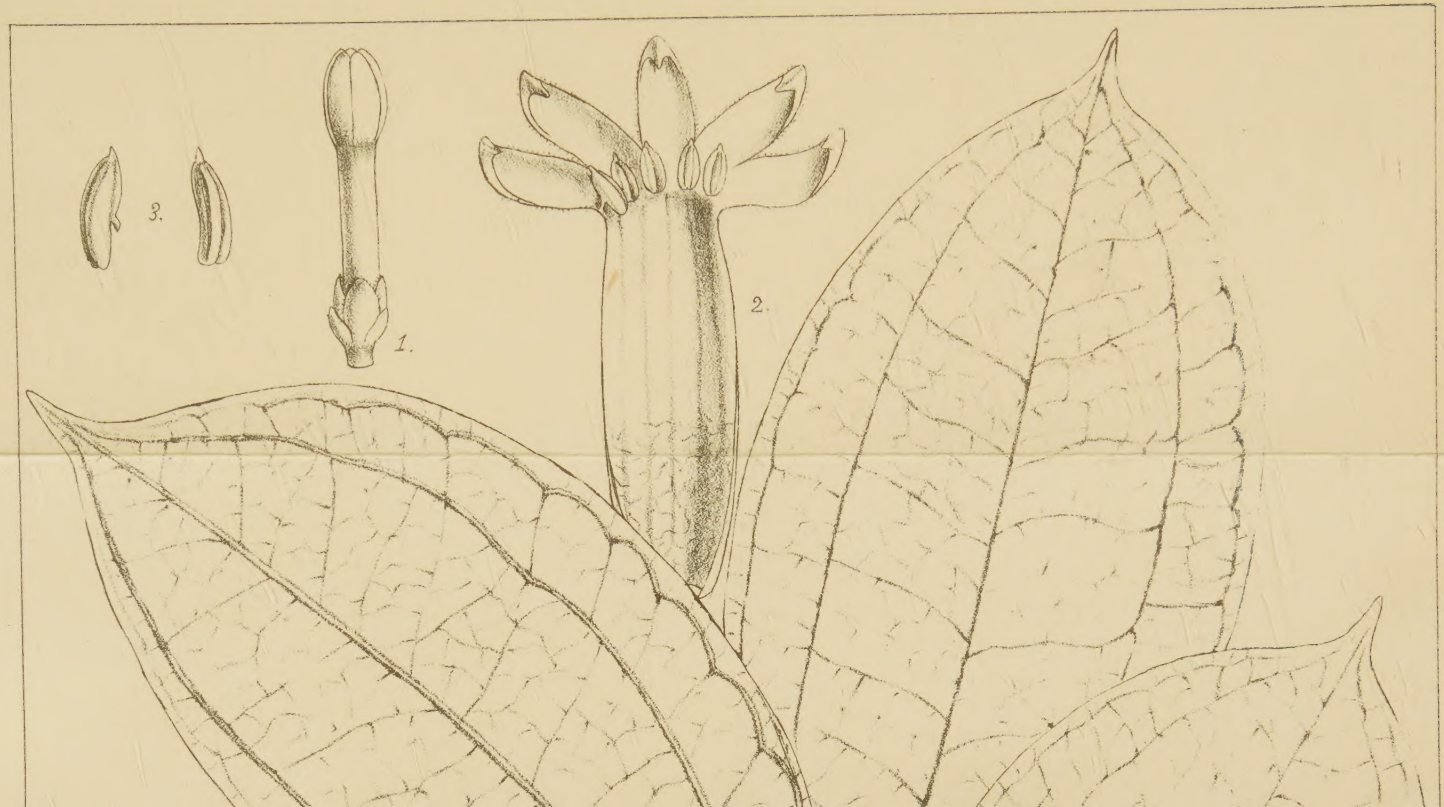
* New Zealand Plants and their Story, by L. Cockayne, pp. 176, illustrated with 71 photographs. Wellington, 1910.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